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***Here are two necessary household appliances that mean nice profits this season***

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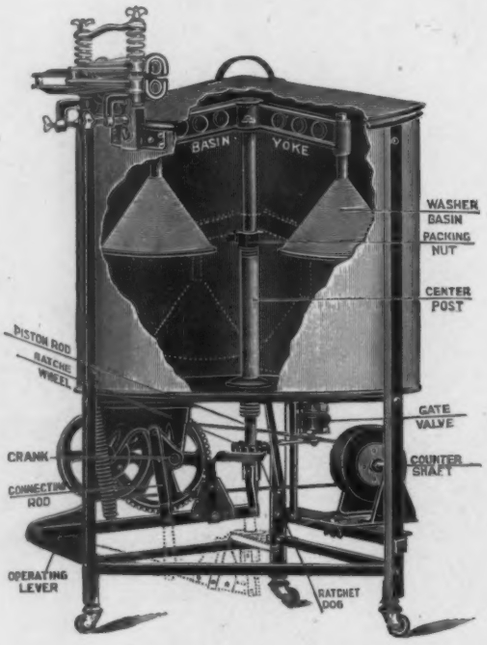
**Motor Operated**

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POWER AND GAS
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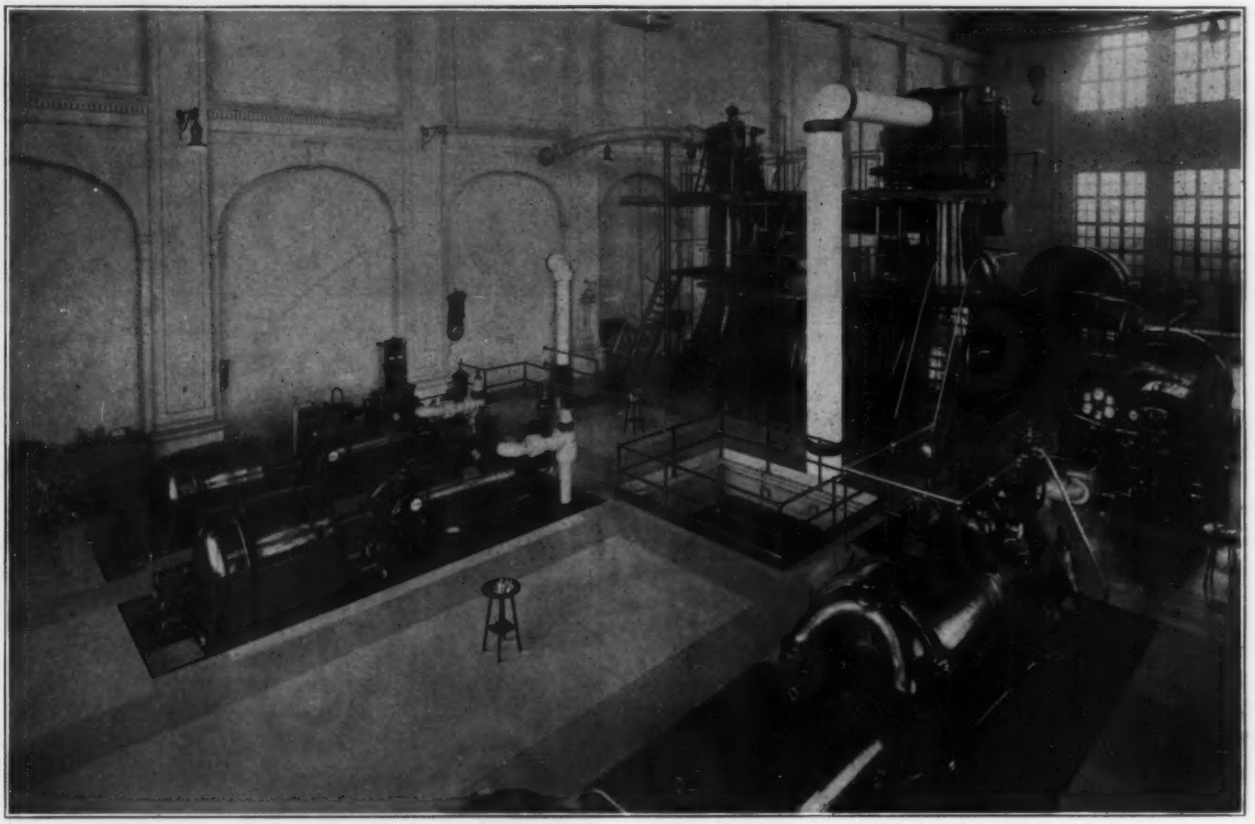
# SAN DIEGO ELECTRIC RAILWAY EXTENSIONS

BY K. G. DUNN.

*(This article comprises a description of equipment recently installed to meet the growing traffic needs of San Diego and the Panama-California Exposition. Particular interest attaches to the control equipment employed and to the operation of a compound condensing steam engine in connection with an exhaust turbine and reduction gear.—The Editor.)*

The city of San Diego has enjoyed a remarkable growth in the past few years and its citizens are optimistic regarding the future growth of their city, and justly so, as San Diego will be the first American port of call north of the Panama Canal. The increased volume of business, due to the Canal trade, the influx of visitors that will have to be cared for during the Exposition period, together with the steady normal increase of this thriving city has made it necessary for the San Diego Electric Railway Company to make extensive additions to their present power house and rolling stock.



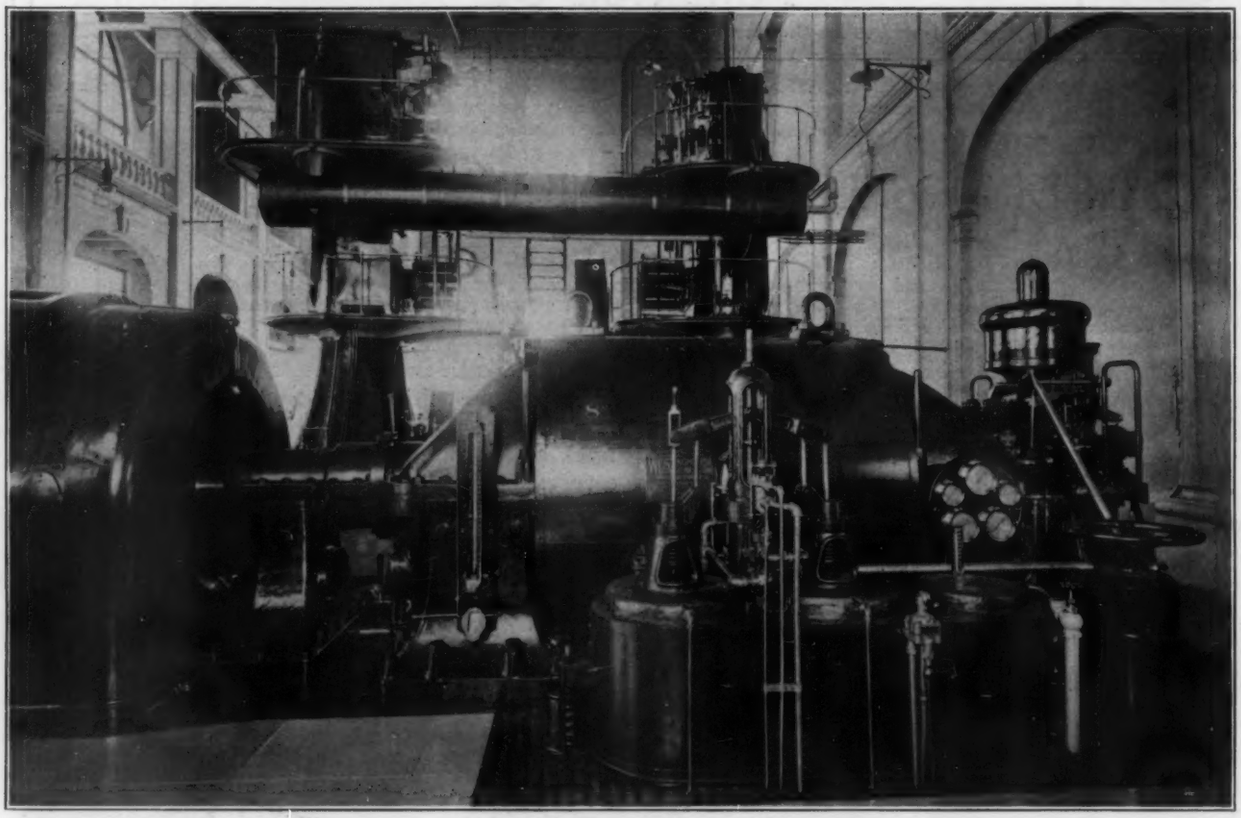
General View of Generating Equipment in San Diego Electric Railway Company's Plant.

A new double track line is being constructed through Balboa Park and a terminal station will be built on this line at the eastern entrance to the Exposition grounds. The largest percentage of the Exposition traffic will be handled by this line. This double track line through the park is not of a temporary nature, exclusively for the Exposition, but it is to remain as a permanent improvement as the line continues north of the Exposition terminal and connects with the present trackage on University avenue. This line will virtually give an express service to points north of the Park and East San Diego and will result in a reduction of ten minutes in the running time.

Extensive improvements are now being made in the down town district in order that the Exposition service to the main entrance can be operated over a

loop and avoid the turning of cars. All new track that is laid in paved streets consists of 114 lb. 7 in. girder rails laid in the most approved manner.

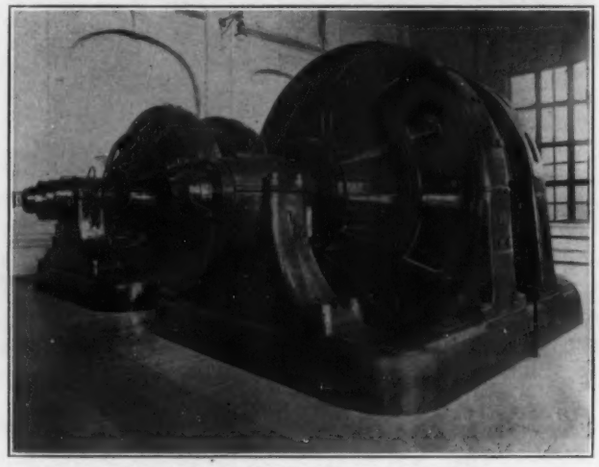
All of the recent rolling stock purchased by the San Diego Electric Railway Company is of the most modern type, center entrance cars having an open and closed section. These cars have proven especially adapted to the climatic conditions existing in San Diego. The cars are of the pay-as-you-enter type and are equipped with multiple unit control in order to allow of train operation during periods of congested traffic. The cars were designed by Homer McNutt, superintendent motive power,, San Diego Electric Railway Company, and many novel features are embodied in their construction.



Low Pressure Turbine Unit.

The addition to the power plant equipment consists of a 5000 kw. Westinghouse-Parsons steam turbine unit with direct connected exciter, together with motor generator sets and switchboard. The unit is served by a 13,000 sq. ft. surface condenser with steam driven auxiliaries. The circulating water supply to the station is furnished through a 54 in. concrete gravity intake line and a discharge line of like capacity. These conduits terminate in a chamber arranged with gates so that the circulation in the conduits can be reversed and alternately used for suction or discharge purposes. Circulating water to all condensers in the plant is furnished through a common header system. The discharge from all condensers is operated on the syphon system.

Two 1500 kw. General Electric synchronous motor generator sets have been installed and foundations and conduits for the third set are now in place. These sets are liberally proportioned and are capable of operation at 50 per cent overload for two hours. Each set has a direct connected exciter and provision has been made for separate excitation from an auxiliary bus in the event of failure of the direct connected exciters. These sets are also equipped with magnetic oscillators and speed limit trip devices, which operate a shunt trip on the positive breaker. The exciter speed limit and oscillator wiring are carried up through the bedplate and pedestals, making a neat arrangement. The motors

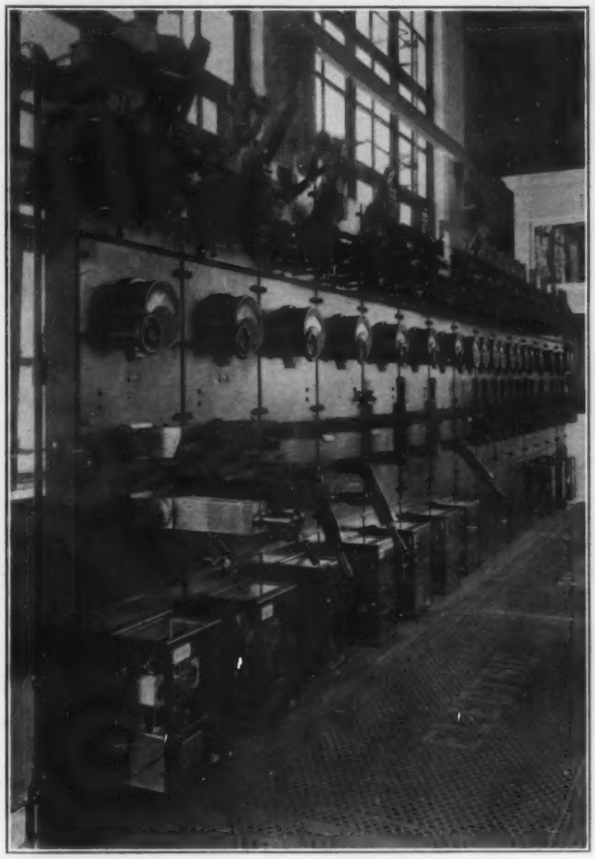


Synchronous Motor Generator Sets.

are of the self starting synchronous type; two large capacity compensators have been installed and so arranged that either compensator can be used for starting any motor generator set.

The negative and equalizer busses are installed in the basement and carried on brackets immediately underneath the machines. Each bus consists of several leaves of ¼ x 5 in. copper bus and bus copper connections are between these busses and the negative and equalizer machine terminals.

The alternating current switchboard is electrically operated with the exception of the main exciter switches. The panels are 16 in. wide and all meters are of the 7 in. type. The field switches to the main generator and motor generator sets are electrically operated, there being two switches for each field, one



Front View of A.C. Switchboard.

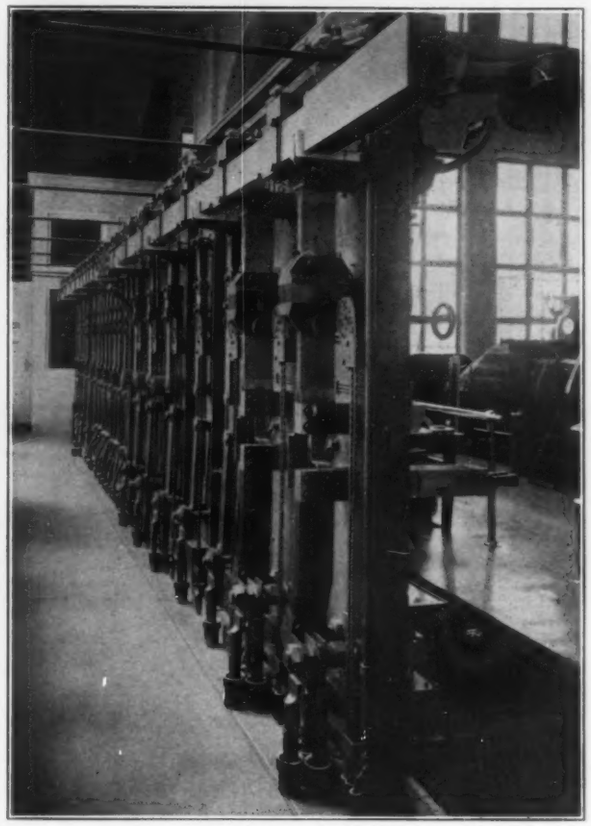
controlling current from the direct connected exciter and the other controlling current from the auxiliary bus.

The electrically operated field switches are mounted on the foundation wall of each particular unit, which makes the shortest possible wiring arrangement. It should be noted in connection with the self starting synchronous motors that this arrangement eliminates the possibility of an operator coming in contact with the exposed field switch terminals which are subjected to a high induced voltage at the moment of starting.

A single a.c. bus is installed at present, but provision is made on the board for an auxiliary a.c. bus. The handles, face plates and lenses for signal lights have been installed for the future a.c. bus as shown by the front and rear views of the board.

All oil switches are placed in a concrete cell structure situated on a balcony above the control board. All instrument wiring is carried in conduit imbedded in the concrete structure. The oil switches with their operating mechanism and the bus are placed on one side of the cell structure while the disconnecting switches, series transformers and potential transformers are on the opposite side of the cell structure. Small panels for integrating wattmeters have been installed on the wall of the building opposite the disconnecting switches. Cells for future switches, together with control and main lead conduits have been provided.

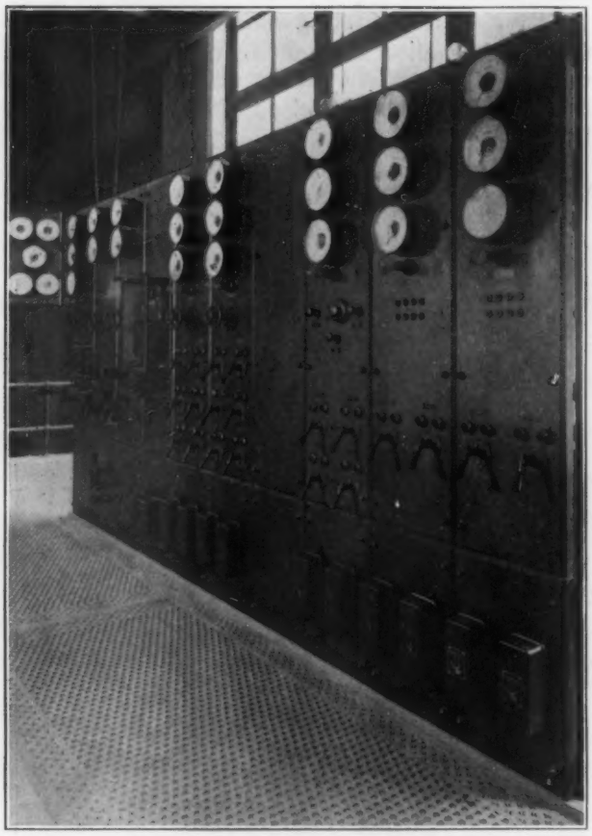
The control for the starting switches to the motor generator sets operate both the starting and magnetizing switches so that there is no possibility of an operator neglecting to open the magnetizing switch to the compensators. The switches are electrically interlocked so that the running switch cannot be closed when either or both of the magnetizing and starting switches are closed and vice versa. One of the panels controls two exchange circuits between the plants of the San Diego Consolidated Gas & Electric Company and the San Diego Electric Railway Company, another panel supplies current through a submarine cable to the City of Coronado and the last panel controls a tie line between the new board and an old board which controls two small a.c. turbines and two induction motor generator sets.



Rear View of A.C. Switchboard.

From an inspection of the rear view of the board, it will be noted that a large amount of control wiring is carried up through the pipe columns. Special junction boxes are installed at the foot of the columns, this arrangement protecting the control wiring from mechanical injury and presenting a neat appearance on the back of the board.

The board at the present time controls seven generators, eight city feeders, three interurban feeders and the auxiliary apparatus for the station. As previously stated, the negative and equalizer busses are



Front View of D.C. Switchboard.

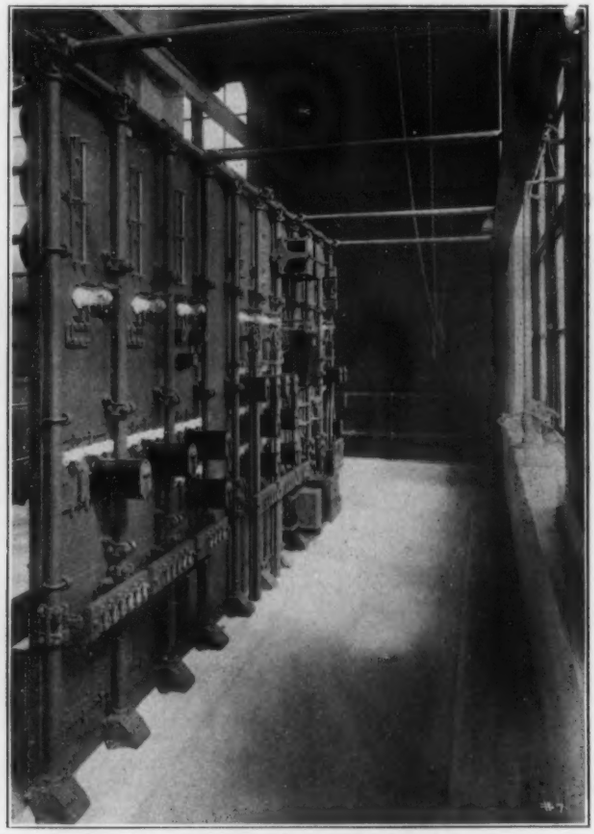
in the basement and only the positive leads of the apparatus are carried to the board, except the necessary negative connection for voltmeter plugs and wattmeters. The feeders pass directly from the board to potheads placed immediately below the board in the basement and lead covered cables are installed in vitrified clay conduits to points beyond the underground district where they connect with the overhead distributing system.

The boilers are placed at right angles to the engine room. A totalizing ammeter on the division wall between the engine room and boiler rooms, in plain view of the firemen, indicates the total direct current output of the station and gives a visual indication to the firemen of the exact load on the plant. This instrument has been in service for several months and the firemen depend absolutely on its indication. It is interesting to note that since its installation there is a marked improvement in the regulation of steam pressure, as shown by recording pressure gauge charts.

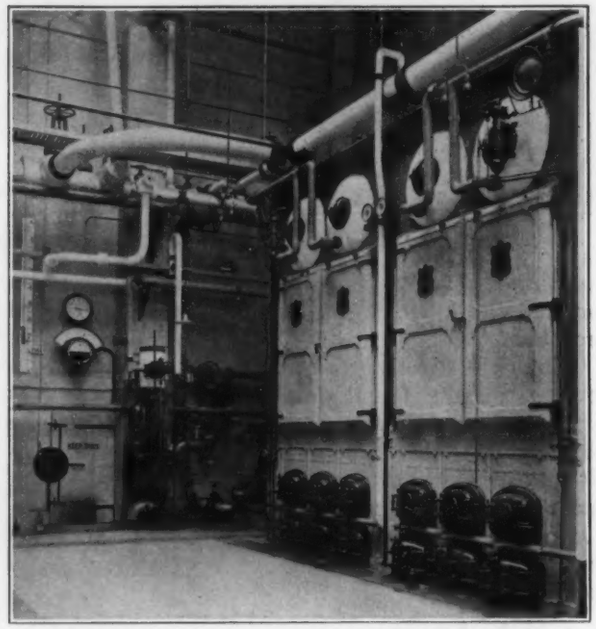
A master steam gauge is mounted on the face of the Weston indicating ammeter.

All boilers are equipped with General Electric steam flow meters, which are just as essential as ammeters on the direct current generators. The boilers are of the Babcock & Wilcox type and are regularly operated over swings and peak loads in excess of 200 per cent of the builder's rating.

The engine is a vertical cross-compound Allis-Chalmers unit, direct connected to a 1200 kw. Westinghouse 600 volt generator. The exhaust from this engine is delivered to a 1000 kw. Westinghouse-Parsons exhaust turbine operating at 3600 r.p.m., and



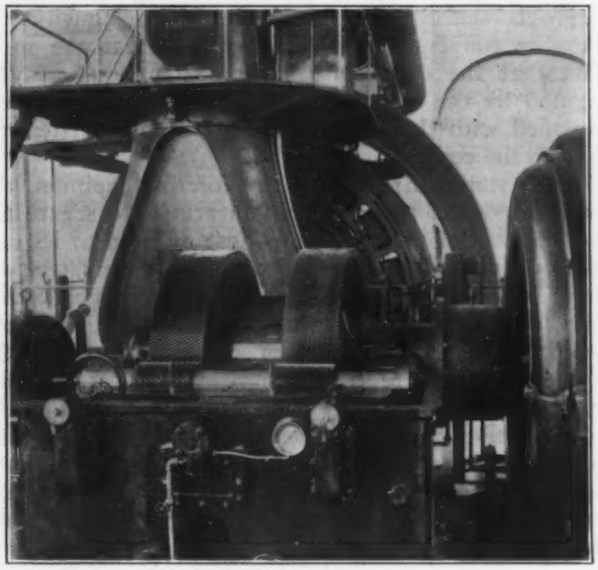
Rear View of D.C. Switchboard.



Portion of Boiler Room, Showing Totalizing Ammeter.

is direct connected to a gear having a 7 to 1 reduction, driving a 1000 kw. Westinghouse 600 volt direct current generator at 514 r.p.m. This combination unit is of particular interest as it is a case of a high duty compound condensing engine being operated in connection with an exhaust turbine and reduction gear.

The unit has been in operation three years, the actual hours operation showing more than two years' continuous twenty-four hour service. The gear is of the Westinghouse floating frame type and at the present there is practically no wear. From all indications its life should be as long as that of either the turbine or generator. The turbine is of the variable inlet pressure type. During times of lighter load there is from 10 to 15 inches vacuum in the low pressure



Turbo Generator Gear.

cylinder, while at periods of heavy load, the low pressure cylinder is exhausting against 1 lb. gauge back pressure. Under present load conditions, the engine and exhaust turbine carry the load during the off peak period and other units are operated during the morning and evening peaks.

The station furnishes current to the railway exclusively and operates twenty hours per day. Under the present load conditions the station is delivering 180 kw. hours of direct current to the bus bars per bbl. of fuel oil. Hunt, Mirk & Co., Inc., installed all apparatus.

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**The economy of converting horse-drawn fire apparatus** to motor operation is shown by some figures compiled for a former horse-drawn fire engine, which was equipped for battery drive by the New York fire department. The front wheels of the vehicle were replaced by couple - gear motor-driven wheels operated from a storage battery. The conversion cost $4000, but the reduced expense at which the vehicle has since operated apparently justified the change. Renewals and repairs for two years subsequent to the change cost $744.39. Of this amount $486.97 was spent in renewing the battery after the vehicle had been in service one year. Adding to the above maintenance expense, the depreciation and battery charging costs, the total operating expenses for the two years amounted to $1370.03, as compared with an average of $1469.06 for horse-drawn fire engines answering about the same number of calls.

## CONSTITUTIONALITY OF THE 1913 NEVADA IRRIGATION ACT.

BY A. E. CHANDLER.

The office of the state engineer of Nevada was created in 1903. The irrigation act of that year provided for the determination of water rights upon streams by the state engineer. The act was founded upon the irrigation acts of Wyoming and Nebraska.

The Nevada act has been amended a number of times since 1903 and in 1913 was so amended as to include more details of procedure leading up to the determination—following very closely the Wyoming act.

At the time of the passage of the 1913 amendment the state engineer of Nevada was engaged in determining the water rights along the Humboldt River. He continued doing so after the adoption of the 1913 amendment, but made his practice conform to the provisions thereof. Certain farmers of the Lovelock Valley, the lowermost valley along the Humboldt River, attacked the constitutionality of the act and the Supreme Court of Nevada, under date of August 4, 1914, handed down its opinion—the name of the case being Anderson v. Kearney.

Mr. Justice Norcross, who wrote the opinion for the court, after briefly summarizing the provisions of the act of 1913, shows that the real aim of the act is to vest in the state engineer the distribution of water among those entitled to its use. The following quotation shows his realization of the need of vesting such control in a central body:

**It is difficult to perceive haw there may be any effective regulation or control over the water rights of a stream system like that of the Humboldt River and its tributaries, except through some form of state supervision. This river extends for a distance of about three hundred miles, is in five counties and three judicial districts. According to the brief of counsel for respondents in case No. 2115 there are from 800 to 1000 water users on the Humboldt River system. Undoubtedly other claimants are constantly applying for water rights on this system. The state at large is not only interested in protecting prior appropriators in their rights, but is interested in the conservation of the waters of the stream system to the end that the largest possible amount of land may be brought under cultivation through an economical diversion and use of such waters. To accomplish this beneficial object, the state has a right to exercise a superintending control over the entire river system. It is not to be assumed that so great and so important an undertaking cannot be fairly and intelligently administered. If so administered it would seem that it ought to be particularly advantageous to prior appropriators. It is the history of irrigation in this and other states that the first appropriators of waters upon the natural streams are frequently forced into long, vexatious and expensive litigation to protect their rights against subsequent appropriators. The case of Bliss vs. Grayson and Anderson in the state courts, involving water rights on the Humboldt River and Miller & Lux vs. Rickey et al., in the Federal Court, involving water rights on the Walker River, are conspicuous examples showing the need of some kind of intelligent state intervention. The case of Bliss v. Grayson begun in the District Court of Humboldt County in July, 1889, reached the Supreme Court a decade later, with the result of a reversal and a new trial ordered. (Bliss vs. Grayson, 24 Nev. 422.)**

According to Mr. Justice Norcross the real question before the court was as to the right and authority of the state engineer to make determinations of water

rights—it being argued that such action was clearly judicial, and, therefore, beyond the power of an administrative officer like the state engineer.

After a careful consideration of opinions by the Supreme Courts of Wyoming, Nebraska and Idaho dealing with cases wherein it was claimed that the state engineer was exercising powers exclusively judicial, Mr. Justice Norcross holds that the action by the state engineer is clearly administrative and not judicial. He further states that it is unnecessary at this time to consider other constitutional questions raised in the case, especially in regard to the finality of the state engineer's determinations.

The opinion shows that Mr. Justice Norcross fully appreciates the effectiveness and necessity of a determination of water rights in a manner different from the ordinary court procedure, and that he seeks substance rather than form.

Mr. Chief Justice Talbot concurs with Mr. Justice Norcross in so far as he believes the determinations by the state engineer to be administrative. He states, however, that the section of the act making the determination by the state engineer final, unless appealed from, is unconstitutional. He raises a further question as to the right of the state engineer to distribute the water of the stream in accordance with his determinations, as is shown by the two final paragraphs of his concurring opinion quoted below:

**It being concluded that the state engineer may take evidence and determine water rights for administrative purposes, and that his determinations are not binding as final adjudications, even if no appeal from them be taken, the further question arises as to whether, on the same theory that banks, railroads and public service corporations are controlled, the state engineer, with the assistance of the duly appointed water commissioner, may allow, restrict and regulate the use of the water claimed under vested rights without impairing them, in accordance with his determinations subject to the right of any water-user who may feel aggrieved thereby to apply to the courts to restrain the state engineer or the water commissioner from depriving the appropriator of any water to which he may be entitled.**

**If the parties or any of them desire to have this question determined, it may be suggested that counsel present their views regarding the same in a petition for a rehearing or answer thereto. The case is of unusual importance, and if this question is to be determined it should be given due consideration.**

Mr. Justice McCarran, in a long dissenting opinion, holds that the sections of the act in question are clearly unconstitutional and that the state engineer has on right or authority to determine water rights.

The fact that each of the three Justices of the Supreme Courts wrote a separate opinion shows the importance of the question before them. The only point really decided is that the state engineer as an administrative officer may proceed under the provision of the act to determine for administrative purposes the water rights along a stream. Two Justices, however, declare that such determinations cannot be considered final even if not appealed from—the act making full provision for appeal to the courts in all cases where parties are aggrieved by an order of the state engineer.

There is little question among students of water right conditions as to the most expeditious way of determining water rights. There is much question, however, among lawyers as to how far administrative officers may go in this determination. The trouble lies in the technical interpretation of the constitutional provisions dealing with the division into the three departments—legislative, administrative and judicial—and with procedure in the last department.

It is a practical question as to whether a determination by the state engineer is of any use without a provision for making it final. It is claimed by a number conversant with the subject that the mere fact that the question has been so carefully investigated by the state engineer will make water users satisfied with the determinations without further resort to the courts.

As stated in Mr. Justice Norcross' opinion, the real purpose of recent irrigation acts is to secure the distribution of water among those entitled to its use. Before this can be done the water rights must be determined. Unless such determination is final there is bound to be trouble during seasons of drought when water commissioners must close the headgates of the ditches having the latter priorities. A case is now in the courts wherein certain water users in Muddy River Valley in southeastern Nevada are attempting to enjoin the water commissioner and state engineer from interfering with their headgate, and such cases will constantly arise unless the determination is made final.

In view of the doubt cast upon the efficiency of the 1913 Nevada irrigation act, the construction of the Oregon irrigation act becomes of the utmost importance. The latter act is very similar to the Nevada act, except it provides a method whereby a court passes upon the determination without waiting for an appeal by aggrieved parties. Cases involving the constitutionality of the Oregon act are now in the courts.

## ELECTRICAL INDUSTRY AND THE WAR

The electrical industry has been hard hit by the war in Europe. General Electric, while it has no great foreign connections or branches, has been greatly affected by the war and earnings and shipments have fallen off sharply since August 1st. The company now has 9000 fewer men than one year ago. The 8 per cent dividend is understood to have been earned in the first 7 months of this year, but many of the corporations which buy its products have to do so with borrowed money, and hence a heavy falling off is expected because only the soundest corporations will be able to borrow and they will have to cut down their needs in this respect to a minimum. In view of this a cut in the dividend would not be considered a big surprise to those in close touch with conditions.

Western Electric's plants in Antwerp and Paris have been closed and 800 Edison Company employes have been laid off. The Westinghouse Company's foreign plants have curtailed or cut down and there has been a great deal of confusion as the result of the disruption of the relations between the American and foreign plants.

## THE BUCKHORN LOCOMOBILE POWER PLANT.

BY A. N. VOSS AND J. G. SCRUGHAM.

*(A description is here given of a locomobile steam-electric power plant which is giving an output of 1 kw. for 1.7 lb. of oil. Mr. Voss is chief engineer of the Buckhorn Mines Co. and Prof. Scrugham acted as consulting engineer. This was presented as a paper at a meeting of the Nevada Industrial Safety Association on Sept. 7, 1914.—The Editor.)*

The power plant of the Buckhorn Mines Company at Beowawe, Nevada, consists of a unique installation as far as prime movers are concerned, there being installed two 290 h.p. units of the Wolf locomobile engines, made in Germany. The engines rest directly on the boiler shell, which is made of 1 in. boiler plate. The flue sheet is 1 in. thick, the flues being standard 3 in. flues of extra heavy material, and 94 in number. Seventeen of these flues serve as stay bolts, being threaded on both ends, and made of heavier material than the others. Directly behind the flues is the superheater, consisting of many turns of pipe made up into a coil. Steam is generated at 225 lb. pressure and superheated 210 degrees so that at present we have an average steam temperature of 600 degrees F. at the throttle.

The firing system, as originally installed, was the gravity feed, steam atomization, but this was found to be unsatisfactory and uneconomical, chiefly because of insufficient combustion space. To remedy this defect an extension furnace, 48 in. diameter and 36 in. long, was built and attached to the front of each boiler. This furnace extension is mounted on a truck to permit ready removal from the boiler. All bricking was removed from the interior of the furnace except an arch-supported wall 2 ft. from the flue sheet and a brick lining in the extension. This furnace rearrangement effected a saving of approximately 12½ per cent in the fuel costs.

A new system of firing was also installed. It now consists of a pump, heater, oil line, and burner arranged so that the oil pressure can be varied to suit requirements, oil kept at 250 degrees F. This oil is forced through a burner, normally at 120-140 lb. pressure, where it is broken up by a mechanical atomizer and discharged into the furnace. A regulating cone is placed about the burner tip, so that by adjusting this cone the amount of air necessary to obtain complete combustion can be accurately regulated. Under ordinary conditions little adjustment of oil pressure or cone is necessary.

The two cylinders of the locomobile are mounted side by side directly over the fire box, being respectively 12½ in. and 24½ in. diameter. The pistons are of the balanced type, having a stroke of 19¾ in. The packing for the stems is metallic.

The crank shaft is 8 in. diameter and turns at 225 r.p.m. A fly-wheel is overhung from each outside bearing.

The governor is a fly-wheel governor and is guaranteed to vary not more than 3 per cent above or below the predetermined speed and I will say that it takes advantage of its entire allowance.

The vacuum pump is connected to the engine by means of a belt device from a hub cast on the fly wheel. The plunger of the vacuum pump has an extended stem on the end of which is the plunger for the feed water pump. No matter what goes wrong, be it only packing blown out on pump stems, we are compelled to take one unit out of service until it is repaired.

The engines are directly connected to 175 kw. General Electric 3-phase, 60-cycle, 480 volt a.c. generators with 35 kw. belted exciters, each exciter large enough to excite both generators. Under ordinary conditions one of these exciters is motor driven, but is in such a position that the belt can be run from the pulley on the generator. A Tirrell regulator on the exciter field keeps the exciting current so as to maintain constant potential on the busses.

The switchboard is composed of three panels of blue Vermont marble, one for each generator and one for the main line. On each generator panel we have an a.c. ammeter, d.c. field ammeter, and a.c. indicating wattmeter, and on the main line panel we have an a.c. ammeter with 3 way switch, power factor indicator, graphic recording wattmeter, integrating watt hour meter, and graphic recording voltmeter. On a swinging panel at the right of the switchboard is a synchroscope, bus voltmeter, generator voltmeter and frequency indicator. The d.c. exciter voltmeter is mounted over the switchboard.

Three 175 kw. General Electric transformers step up the voltage from 480 to 30,000 for transmission to Buckhorn, 30 miles away.

The line is 3 No. 4 B. & S. gauge solid copper spaced on the corners of a 5 ft. triangle. Wooden pole construction is used throughout. Thirty-five foot 7 in. top poles are set 250 ft. apart and 5 ft. deep. The crossarm is wood and pole top pin is wood; the pins in the crossarm have porcelain base. The insulators are No. 311 Locke. The phone line runs on brackets 5 feet below the crossarm, No. 44 Locke insulators and No. 12 B. & W. iron wire being used. The line is transposed every 10 spans.

General Electric electrolytic lightning arresters are installed on both ends of the line. We have had very severe storms during the past four months and have had no trouble anywhere except that due to our own fault.

At Buckhorn 3 General Electric 175 kw. transformers step down the potential from 30,000 to 480 for motor use, and one 20 kw. transforms from 30,000 to 220/110 for lighting.

The most interesting feature of the performance of the unit is the high fuel economy.

The record sheet shows an average fuel consumption of 1200 bbl. of 13.2 gravity oil per month, producing approximately 240,000 kw. hours at the switchboard, or 200 kw. hours per bbl. of oil weighing 240 lbs., equivalent to 1.7 lbs. of oil consumed per kw. hour net output. As the engines are only loaded to 80 per cent of capacity, it is probable that this performance can be excelled with full load conditions. The mechanical efficiency of the unit is about 92 per cent as obtained from the ratio of indicated to brake horsepower.

More detailed figures on the performance will shortly be available as it is planned to conduct a complete mechanical test at an early date.

## ELECTROLYTIC HOIST CONTROL.

BY E. P. CULLINAN.

*(This interesting description of a method of flexible control of electric mine hoists was presented as a paper at the recent meeting of the Nevada Industrial Safety Association. The author is electrical engineer for the Tonopah-Belmont Development Company.—The Editor.)*

As Nevada is a foremost precious metal producing state, it is not surprising that she should advance to meet the changes and conditions confronting her. Not so very long ago steam hissed and coughed from every hoist-room of mention; but electricity has now, in nearly every case, supplanted steam.

In the past, the control of electricity—particularly on large hoists—has been a serious and troublesome undertaking, caused by the crude design of both motor and controller. The large electrical manufacturing companies of the world have now reached a higher plane in the late hoist motors; and, I might say, have recently produced some favorable controlling machinery.

A proper control for electric hoists is one that will start a rated load slowly, and increase momentum without jerking, until the required speed of the motor has been attained. And the company that pays the bills for operating this hoist, requires it to be done economically.

Most large electrical manufacturing companies of the country have adopted a remote control operated by a pilot switching device—this pilot switch is usually operated by hand, and, in turn, throws current into large electro-magnets that operate air-valves, or other mechanical devices—while others use electro-magnets directly, in opening or closing switches for control of the hoist. Thus, in one case you must have a small compressor and a motor with large electro-magnets, valves, etc., while in the other you require many electro-magnets, all of which takes a great amount of electric current. I may add, that in Nevada up to the present time electricity has been found rather expensive.

Now, if it stopped there it would not be so bad; but the expense goes on through the controlling circuit. The method of controlling most three-phase hoists in Nevada, is through cutting out the resistance in the secondary, or rotor, circuit of the motors. This is done by most of the big manufacturing companies in six positive steps; every time one of these steps is made there is a surge, or jerk, to the machinery. At the same time there is an unnecessary rush of current until the motor has speeded up to this required energy. Probably some of you have experienced this joker on your automobile with the clutch on; and changed from the low to the second, or to the high speed gear when your car was still, or moving slowly. You might say that one was foolish to do this, as something might break or you might stop your engine. Yes, but you have no flexible way of getting full-speed quickly, although anxious to do so. Your gears are positive, and motion essential; and if it must be done, it will be at the expense of your pocket book.

Therefore, take the hoist-resistance cutout with six positive steps—I say positive because it is a contact between two or more metals—then take the Tonopah-Belmont Electrolytic Control, with its 60 flexible steps. I say flexible because it is through copper plates ⅛ x 4 x 24 in. connected close together on the resistance grids by wires. The tips of those plates coming in contact with a salt solution—instead of metal, as others use—reduces the flow of current in your motor to anything desired, making an absolutely flexible control. So flexible, in fact, that we can cut out the entire resistance and bring to full speed, in about ten seconds, the 300 h.p. hoist geared to a rope speed of nearly 1000 ft. per minute, with a load of about five tons; the ampere meter failing to show when the steps were made. I may say, also, that as high as 1200 amperes have been successfully handled in our secondary circuit. And this with a lever that works horizontally and then vertically, easily operated by the hoist engineer, with one hand.

The horizontal movement switches the current on the primary or stator, of the motor so as to change the direction of rotation. That is to say—the switch standing in the center, would be neutral, or off, position; but by moving the lever to the right gives the hoist one direction, and moving it to the left the reverse. This lever can never make the vertical movement until after the extreme right or left travel has been made. The vertical movement now controls the rotor-speed of the hoist by the gradual immersion of the 60 graduated plates, one after another—that is to say, if the first plate is 16 in. long, the next one would be 15 7-8 in., the next 15 6-8 in. and so on for the entire number. The solution acts as the conductor to bridge, or connect, the plates which are suspended from an insulating fibre, and are one-half an inch apart.

The things that we avoid are:

a—Those excessive and fluctuating peaks.

b—The extravagant and unnecessary current at starting.

c—The jar given the machinery as each of the six sections of the resistance are "chopped" out.

d—The "kicking" of the power companies at our pulling the generators off their foundations and then letting them "run away."

And finally—the expense of equipment; installing and maintaining compressors, motors, electro-magnets, switchboards and valves for operating switches to accomplish what the Tonopah-Belmont, and its properties, does so easily by hand.

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**Standard methods of gas-testing** is the subject of a new circular from the U. S. Bureau of Standards. The five principal subjects discussed are: 1. Measurement of heating value; 2. Candlepower determination; 3. Determination of impurities (hydrogen sulphide, total sulphur and ammonia; 4. Taking of gas pressure records; 5. Gas meter testing.

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**Chemical gaging** of water discharge is proving more accurate than either the Pitot tube or the current meter in determining water-wheel performance. A salt solution of known quantity and concentration is introduced above the inlet, and water samples collected below. The relative concentrations indicate the relative flow, from which it is possible to calculate the quantity of flow within 0.1 per cent.

## PUBLIC POLICY.

BY F. T. POST.

*(After defining the meaning of public policy and the growth of regulation of public utilities, the author calls attention to peculiar conditions now existing in the Pacific Northwest and makes suggestions for remedying them. This paper was presented at the Spokane convention of the N. W. Electric Lt. & Pr. Assn. on Sept. 11.—The Editor.)*

Public policy is not synonymous with public sentiment, but, like public sentiment, it may be merely a temporary whim of the majority. Public sentiment does not become public policy until it has been moulded into more or less definite form as a part of the law of the land.

A few of the definitions of the term "public policy," given by the courts, may be of interest.

In the case of Hartford Fire Insurance Company vs. Railway Company, 175 U. S., the Supreme Court said:

**Public policy is variable; the very reverse of that which is the policy of the public at one time may become public policy at another; hence no fixed rule can be given by which to determine what is public policy."**

In another case that court spoke as follows:

**In determining the question what is the public policy of a state and what is contrary to it the court cannot look at general considerations of the supposed public interests and policy of a state beyond what its constitution and laws and judicial decisions make known. The court is not at liberty to travel out of the record in order to ascertain what is against public policy of a state.**

The Supreme Court of California defines "public policy" as follows:

**"Public policy" is a term of vague and uncertain meaning, which it pertains to the lawmaking power to define, and courts are apt to encroach on the domain of that branch of government if they characterize a transaction as invalid because it is contrary to public policy, unless the transaction contravenes some positive statute or some well-established rule of law.**

The Circuit Court of Appeals for the Eighth Circuit, in an important case, uses the following language:

**The public policy of a state or nation must be determined by its constitution, laws, and judicial decisions, not by the varying opinion of laymen, lawyers, or judges as to the demands or interests of the public.**

From the time of the beginning of traffic and trade between human beings, there has been an irrepressible conflict between the producer and the consumer. Substantially all of the people belong, in a broad sense, to both classes. Those who do not directly produce are connected directly or indirectly with those who do produce or with those who assist in the general business of marketing the product; while the class of consumers, of course, comprise the whole people.

The individual, as a part of the producing class, naturally desires to fix a high price for the product in which he is interested, and as a part of the consuming class desires to fix a low price for the product which he buys. This is illustrated by the general attitude of the farmers of the country who are strong advocates of combinations and organizations which tend to establish and maintain high prices for agricultural products and are opposed to all organizations and combinations having the same tendencies or results as to manufactured products which they may desire to purchase. Such is the natural bent of the mind of all mankind and it cannot be changed by constitutions, statutes or courts.

At the present time we are dividing the business of the world into two broad general classifications. One we refer to as "public callings" and the other as "private business." We say that the manufacture and sale of gas and electric energy for light and power; the renting of a facility whereby one may talk with another at a distance far greater than the voice would carry without the aid of this facility; the transporting of persons and materials in vehicles for hire along the public roads or private rights of way, are public callings. All of these are great conveniences but not in fact necessities. We say that the selling of flour and of meat and of fruit and vegetables, even in a great city, is a "private business" and not a "public calling," although these things are necessary for the very existence of the people in those cities.

As to the "public callings" it is the public policy that they shall be regulated as to price and service by the public through governmental agencies, and that the owner and proprietor shall not have a free hand in that regard. While as to private business, the owner and proprietor shall be unhampered in fixing prices, except that he shall not enter into any contract, combination or conspiracy with any competitor in restraint of trade or for the purpose of monopolizing or controlling the business, public policy being that with free and untrammeled competition, full protection will be afforded the public.

It is doubtless the belief of most people that the regulation of public utilities by governmental agencies is of modern origin and is one of the great conceptions of the 19th century. As a matter of fact it originated in mediaeval times, due to the necessities of the people; later the law of supply and demand seemed able to cope with the problem and governmental regulation was thereupon abandoned. A bit of ancient history in connection with this subject may be of interest.

Professor Wyman in his book on Public Service Corporations, says:

**The mediaeval system involved almost universal regulation of all the doings of men, and therefore its commercial policy was also completely restrictive. The ideal held was a society in which all things were ordered, the full conception being that every man had a right to his place in this established order. This state of affairs was by most men greatly desired. Indeed, a regulated monopoly with the corresponding obligation of public service seemed in that age to the great majority of people far better than unregulated compensation without public obligation.**

In those days, as shown by a decision of an English court in 1441, a physician was required to accept any patient who might call upon him and give him his best attention; that profession being then considered a public calling because such professional men were comparatively few and the necessities of the public required such a holding. For the same reason a similar rule prevailed as to the tailor, the blacksmith, the baker and miller.

In 1635 shopkeepers and merchants were forbidden to charge excessive prices by a statute of Massa-

chusetts, and in 1668 the price of boards was fixed by statute in the Plymouth Colony. Professor Wyman says:

Corn and tobacco, beer and bread, beef and boards, all that was most important for the colonists to have was regulated as a matter of course by the assemblies of the time.

In February, 1652, Peter Stuyvesant and his associates, as Directors and Council of New Netherlands, passed an ordinance that reads very much like a modern order of the Public Service Commission. It is an ordinance regulating the rates and service of the company windmill, and reads as follows:

**ORDINANCE**

**Of the Director and Council of New Netherland Regulating the Windmill. (Passed February, 1652.)**

Whereas, for a long time past not a few complaints have been made to us of the inconvenience to which the inhabitants are put because they can scarcely get their grain ground, or if ground cannot get it in such a state as it ought to be, for which reason the people are received with abuse, curses and threats, to provide against which as much as possible, and to prevent consequent disorder, it is thought proper, for the better accommodation of our good Inhabitants, to appoint a suitable person at a yearly salary to superintend the Honble Company's Windmill, subject to the following Conditions and Regulations to be observed by every one:

1.

The Miller shall be bound and also undertakes as far as the Mill is concerned, to be at the service of all Inhabitants, without distinction of persons, and, Wind and Weather permitting, either by himself or by another qualified person, to serve them as far as he is able, both by night and by day, as opportunity may offer, according to the proverb—First come, first served; also First come, first to be waited on; wherein no one shall consider himself preferred except only the Honble Company which has usually 70 or 80 persons to provide with bread.

2.

None of the inhabitants, whether servant or Freeman, shall be at liberty to carry any grain to the Mill, neither shall the Miller receive any grain into the Mill, without first having obtained a permit of the Office of the Store, whereupon the quantity and quality of the grain are set forth.

3.

In order to make the Clerk more willingly accommodate, and more attentively wait on the Commonalty, One stiver shall be paid him for a permit for 3 skepels and over; half a stiver for a permit under 3 skepels; For toll on each skepel shall be paid three stivers in silver money, or good stringed Wampum, or commodities to the Miller's satisfaction.

4.

The Miller shall register the permits received in order, whenever required by the Director and Council, to render an account of the Toll, to be compared with the Clerk's Register or account book, and he shall not give credit to any one for toll, except at his own risk.

5.

Whereas the Revenue from the tolls ought to defray, besides the Miller's yearly salary, the expenses of the maintenance and improvement of the Mill, for which good pay is required, no person shall trouble or annoy the Miller or his man, by words much less by deeds, in case he refuse poor or unassorted Wampum, but herein apply the common Proverb —Many can carry more than one.

6.

To prevent frauds, evil reflections and especially afterclaps, Weights and Scales shall be placed at a proper time in the Mill, in order that those wishing to do so may deliver in their grain at the scale and receive it back again, according to the Regulation formerly made there, or according to circumstances, hereafter to be enacted.

7.

For the convenience of raising and lifting, no one shall be at liberty to bring more than three skepels in one sack to the Mill, or calculate less toll than for one spekel.

8.

Finally, in order to prevent all disputes, the Miller, on his promise and word, is intrusted with the grinding of every thing at the stated rates, wherewith every one ought to remain satisfied; but if on an extraordinary occasion any one would have the Meal very fine and twice ground, if it can be done without great inconvenience to others, he may be accommodate, at the discretion of the Miller, with one or two runs through (the mill) on payment of three pence per skepel.

Thus done and enacted the ..... February, A° 1652 in the Council of the Honble Director General and Council of New Netherland.

P. STUYVESANT,
LA MONTAGNE,
BRIAN NEWTON.

Regulation of any and all business and callings had practically ceased in the first part of the 19th century. Public policy was opposed to the regulation of all private business, and public callings were practically restricted to transportation companies and innkeepers. The sentiment of the time is illuminated by a decision of the Supreme Court of New Jersey in 1858, in which it was held that a gas company in the city of Paterson was a private business. The question was whether the Paterson Gas Light Company was bound, under the law, to furnish gas to all buildings on the lines of their main pipes upon the applicants therefor agreeing to pay the fixed price and agreeing to comply with all reasonable regulations established by the company. The court, among other things, said:

That no such duty arises out of the mere facts that the company made gas, laid pipes in the streets, and actually furnished it to many persons, may be safely assumed. Innkeepers and common carriers are bound to receive all who properly apply to them, but this is a duty peculiar to them.

We find in this opinion some further language that was in accord with the thought of the nation at that time, but which would seem most remarkable at this time to any court or student of public questions:

The Paterson company is authorized to make and sell gas, which, in the absence of any indication to the contrary, implies that they may fix their own price, and choose their own customers, like any other manufacturer. If the duty of furnishing gas to those requiring it was meant to be imposed, it would doubtless be expressed, and not be left to mere inference. If it is to be inferred, what is to be the limit? Why have not all the inhabitants of the town the same right to demand it as those having buildings on the streets along which the pipes are placed? The charter sets forth the general purposes of lighting all the streets and buildings, and the court below seems to have held that the company has no choice in the matter. But what company in the state, or elsewhere, could have ventured to have assumed such a responsibility as that?

In a few years a great change had come over the body politic, as is shown by a decision of the Supreme Court of the United States in Munn v. Illinois, 94 U. S. 113, decided at the October term, 1876. It appears that the legislature of the state of Illinois had passed a statute regulating service and rates of grain elevators and warehouses generally and the policy of

that statute was questioned by an owner of such a warehouse constructed before the passage of the act. Chief Justice Waite writing the opinion of the court, said:

**Under these powers (police powers) the government regulates the conduct of its citizens one towards another, and the manner in which each shall use his own property, when such regulation becomes necessary for the public good. In their exercise it has been customary in England from time immemorial, and in this country from its first colonization, to regulate ferries, common carriers, hackmen, bakers, millers, wharfingers, inn-keepers, etc., and in so doing to fix a maximum of charge to be made for services rendered, accommodations furnished, and articles sold. To this day, statutes are to be found in many of the states upon some or all these subjects; and we think it has never yet been successfully contended that such legislation came within any of the constitutional prohibitions against interference with private property.**

The court finds as a fact that the grain elevators in Chicago are so located as to practically monopolize the business and that such business is of vital importance to the whole people, and then says:

**Under such circumstances it is difficult to see why, if the common carrier, or the miller, or the ferryman, or the innkeeper, or the wharfinger, or the baker, or the cartman, or the hackney-coachman, pursues a public employment and exercises "a sort of public office" these plaintiffs in error do not. They stand, to use again the language of their counsel, in the very "gateway of commerce," and take toll from all who pass. Their business most certainly "tends to a coccon charge, and is become a thing of public interest and use." Every bushel of grain for its passage, "pays a toll, which is a common charge," and, therefore, according to Lord Hale, every such warehouseman "ought to be under public regulation, viz., that he * * * take but reasonable toll." Certainly, if any business can be clothed "with a public interest, and cease to be juris privati only," this has been.**

Two very able judges dissented from this opinion, namely: Justice Field and Justice Strong, and Justice Field wrote a very vigorous dissenting opinion, beginning with these words:

**I am compelled to dissent from the decision of the court in this case, and from the reasons upon which that decision is founded. The principle upon which the opinion of the majority proceeds is, in my judgment, subversive of the rights of private property, heretofore believed to be protected by constitutional guaranties against legislative interference, and is in conflict with the authorities cited in its support.**

The statutory law in this country is now in such an inconsistent and chaotic condition that it may be doubted if there really is any settled public policy at this time as to either public callings or private business.

As to private business, we have the Sherman Anti-trust act, which forbids all contracts, combinations and conspiracies in restraint of trade, the purpose of which is to insure competition, and statutes of similar character in some of the states and the decisions of the courts under the Sherman Act that such competition shall not be of a ruinous character, but carried on in a gentle manner.

Apparently the present public policy as to private business is that one shall not sell an article at or below cost, as that might drive his competitor out of business or compel him to sell out to the other party. A "fierce trade war," to use the expression of the Supreme Court in the American Tobacco case, might come within the inhibition of the Sherman Act. Only mild and gentle competition is apparently allowable but that is required, and failure of compliance is statutory criminal conduct. Not satisfied with the efficiency of such gentle competition, the real or imaginary sentiment of a part of the people is now calling for the enactment of a statute providing for a Trade Commission, with inquisitorial powers, who will by indirection determine the price to be paid for the products of private business, not including agricultural products. This statute has now passed both houses of Congress with certain differences which will shortly be disposed of in conference. Private business will be no longer private. Prices will be regulated through the publicity given by the government commission and through mild competition and the millennium will be here for a few days.

Public policy as to public callings, commonly called public utilities, is in a condition of inconsistency. The commission statutes generally provide that the service shall be of the best and that the rates shall be just, reasonable and adequate and the commissions are given plenary powers to enforce these requirements. The Sherman Act, supplemented by various state statutes, prohibits all contracts, conspiracies, combinations and methods of any kind or character which tend to restrain competition. Under the commission statutes the rates cannot be raised or lowered without the consent of the commission. The rates of two companies occupying the same field, must of necessity be identical. An agreement as to such rates would be in violation of the anti-trust acts. But as a matter of fact competition as to rates is an impossibility. The public is interested in rates being adequate. An inadequate rate is an unreasonable rate. Adequate service is an impossibility when the rates are inadequate. Under the statute the rates cannot be above reasonable rates. The law demands first class service. The commission has the power to compel it. The field for competition between two companies is of necessity very small, but competition is enjoined by the anti-trust acts. The public policy of one statute conflicts with the public policy of the other statutes.

The public policy of regulating commission statutes recognizes the waste of wealth in duplication of plants, and that not only is the consumer amply protected by the power conferred on an unbiased regulating commission to fix rates and regulate service, but also that the owners of public utilities can afford to sell the product or service on the basis of a lower rate of return when they are protected by the government from unnecessary competition. That is one of the underlying theories of regulating commission statutes, especially exemplified in those states where the statute provides for a certificate of necessity before any plant can be constructed. As opposed to the theory of these statutes are the other statutes compelling competition and waste. It is manifest that if any company is compelled to turn over its business to some governmental agent with power to fix rates and order extensions and improvements to plant and to determine what is a fair rate of return on its investment, that such company is entitled to protection from the government against unnecessary duplication

of plant from any other company and from the results of wasteful competition.

In Washington we have a most anomalous condition. The statute provides that service shall be of a high grade and all rates reasonable and there shall be no discrimination as to rates, except when the public utility is owned by a municipality. Where there are two plants in competition within the borders of a municipality, one privately owned and the other owned by the municipality itself, the municipally owned plant is a free lance, may fix rates below cost, if it pleases, may discriminate as to rates and do various other things which if done by the privately owned plant would subject the officials thereof to punishment under the statute.

Public intelligence has grasped the economic principle that duplication of plant is destructive of wealth and not beneficial but injurious to the public; that unless the owners of public utilities are allowed a reasonable rate of return high grade service is an impossibility and the public must eventually suffer.

Regulation by direct act of the state legislature has been tried out and discarded as a failure. Such a body does not have the time to make a careful investigation and some of the questions involved require long and careful study and technical knowledge. Regulation by politicians is a manifest absurdity. This has been demonstrated under laws that permit the fixing of rates by the councils of municipalities. This method has been given a fair trial in this country and generally discarded. Only a very cities are hanging on to this obsolete system.

The owners of public utilities are entitled to a fair trial before an unbiased tribunal who will have the means to make a thorough investigation of the value of the plant and of all other matters involved and who will be uninfluenced by the coming election or the pledges given before the last election, or the insistent demands of constituents or newspapers, or any other fact or circumstance outside of the material evidence given at the hearing. A candidate for the council who advocated the reduction of gas rates on the stump would be in an awkward position to sit as a judge to decide this question according to the evidence, without bias and without prejudice.

The statutory law of many of the states needs to be changed to make public policy accord with enlightened public sentiment. I venture to suggest a few amendments.

The Interstate Commerce Commission statute provides that not more than a bare majority of that body shall be appointed from the same political party and that the term of office shall be seven years. The states would manifestly do well to adopt similar provisions. A Public Service Commissioner should manifestly remain in office so long as he is doing his work honestly, efficiently and courageously and should not be subject to removal because his political affiliations may not be the same as those of a newly elected executive.

The constitution of many of the states forbids a judge of a court of record from being a candidate for any office, except a judicial office, during the term for which he was elected or appointed. The wise purpose of this provision is to keep judges strictly out of politics. There should be a similar provision as to public service commissioners.

That the principles of law applicable to one public utility do not apply to another public utility engaged in the same business and in competition with the first, is so manifestly unjust that it is almost unbelievable that such a condition should exist anywhere. And yet it does exist in the state of Washington.

The names or the status of the owners of a public utility are not of the slightest importance. Intelligent public sentiment is opposed to rate wars and discriminations. There are two electric light plants in a great city, one privately owned and the other owned by the municipality. The privately owned is forbidden under severe penalty, from discriminating between patrons of the same class as to rates. It must sell in accordance with its published rates; it cannot carry on a rate war. The publicly owned is a free lance and in going after business may do all of the things that the law forbids the other. That is not fair competition; that is not fair warfare. It is assassination.

In most states a public utility, although regulated as to rates and service by one governmental body, obtains its rights or privilege of going into business or continuing in business from some other political body. It may have been in business for a quarter of a century, serving the public carefully and well and complying with all orders of the regulating bodies, and then may be put out of business by another political body, without cause or excuse. This is unscientific and illogical. The policy of the regulating body is to establish rates of service to the people as low as possible. The public utility is entitled to a reasonable rate of return. The question of its annual expense enters vitally into the problem of rates. Pulling in the other direction is another political body that alone has the power to permit the public utility to do business in a municipality. This political body takes the position that a franchise to run pipes or conduits below the surface of the street, or a pole line close to the sidewalk is very valuable and that the public utility should pay annually some considerable sum of money to the municipality, and shall give free service and other things of value to the municipality, thus increasing the cost of operation, which must be reflected in the rates. This political body also takes the position, under the law, that the franchise shall be for only a few years and at the end of that period of time the public utility must come again to this political body and get a renewal of this franchise, otherwise go out of business, and when the time for renewal comes the public utility is at the mercy of this political body, because the public utility has a large investment in the municipality and is required, under penalty of confiscation or destruction of its property, to accede to all requirements of the political body, no matter how unjust or unreasonable they may be. Such is the so-called public policy at the present time in the Northwest.

Nearly all of the present statutory law in relation to regulation of public utilities by commission has been enacted within the last decade. So it may be

said that commission regulation is in its infancy. No public body has greater power for good or evil than these commissions. The public and the public utilities should never lose sight of the fact that the best interests of the public and the public utilities are identical. For instance, the waste from duplications of plant is an injury to both the public and the public utilities, upon the same principle that the destruction of the property of the individual in this horrible European war is a great injury to the whole public in Germany, France, Great Britain and Russia, and as well in the United States and in all other parts of the civilized world. The same principle applies when there is destruction of wealth by the construction of two municipal electric plants when one plant will efficiently serve the public. The expenditure of a million of dollars in constructing a marble palace or a series of dry wells in the Desert of Sahara means a million dollars lost and the whole world is that much poorer.

It is in fact of as much interest to the whole people that the owners of public utilities receive a fair and just rate of return upon an intelligent investment as to the owners themselves. Without it good service cannot be given and all progress must cease.

Enlightened public sentiment accords with the views of the wise managers of public utilities. Unfortunately, public policy as defined in our statutes is lagging behind enlightened public sentiment.

Progress, development and universal prosperity require frank, free and broadminded co-operation between the students of economics, the members of regulating commissions and the managers of public utilities with the end in view of making statutory public policy keep pace with the best thought of the nation.

# ELECTRIC DISTRIBUTION

## ELECTRICAL STANDARDS IN SAN DIEGO.

### D. Overhead Construction.

BY L. M. KLAUBER.

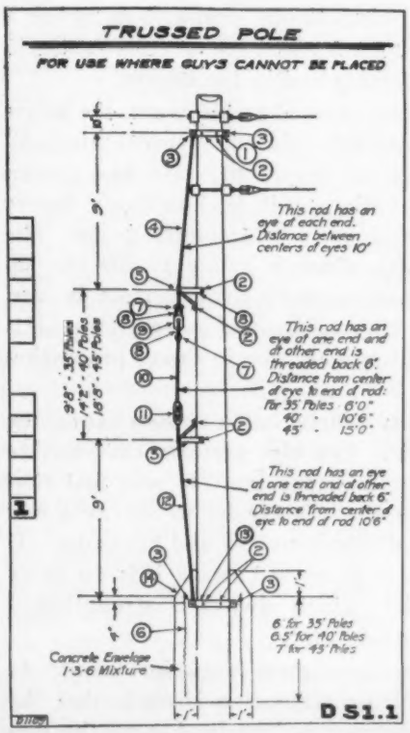
(Concluded.)

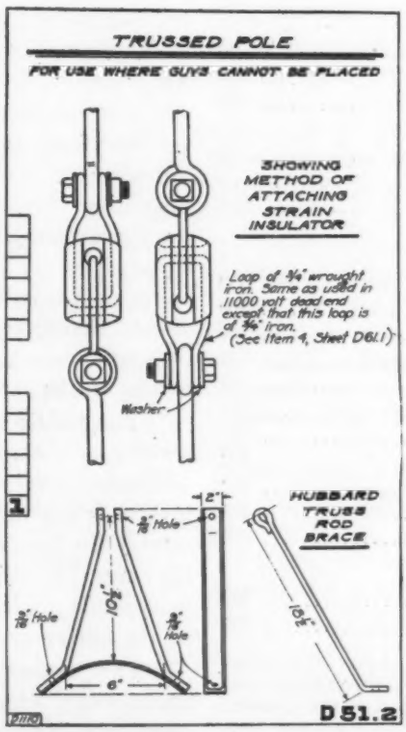
The accompanying plates show standard construction for a trussed pole to be used where guys cannot be placed. These have been developed recently and should be considered in their proper sequence between D 50.8 and D 50.1. The method of attaching the strain insulator and also the details of the collar attaching the rod to the pole are shown. The standard bill of material is as follows, all metal parts being painted with one coat of Glidden's acid-proof coating and one coat of Dixon's black graphite:

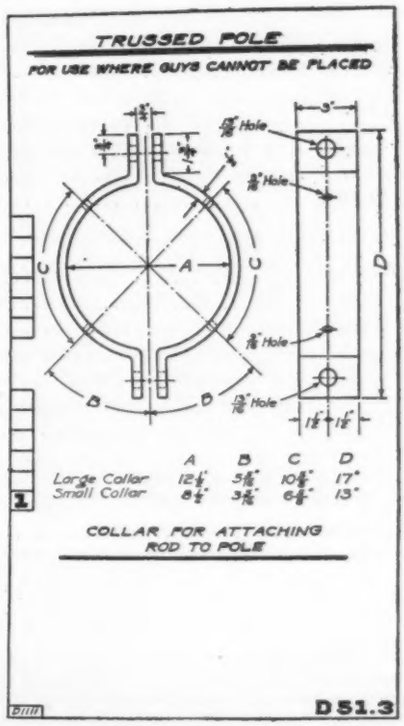
**Bill of Material.**

| Item. | | Quantity. |
|---|---|---|
| 1 | —8½ in. collar | 1 |
| 2 | —½ in. x 3½ in. Galv. Lag Screws | 14 |
| 3 | —¾ in. x 3 in. Machine Bolts | 4 |
| 4 | —¾ in. Rod—See Sheet D 51.1 | 1 |
| 5 | —Hubbard Truss Rod Brace | 2 |
| 6 | —1 pc. 1 in. mesh Netting 6 ft. x 7 ft. | |
| 7 | —¾ in. x 21 in. Machine Bolts | 2 |
| 8 | —Wrought Iron Loops | 2 |
| 9 | —5½ in. Brown Por. Strain Insulator | 1 |
| 10 | —3¼ in. Rod—See Sheet D. 51.1 | 1 |
| 11 | —¾ in. x 8 in. Turnbuckle | 1 |
| 12 | —¾ in. Rod—See Sheet D 51.1 | 1 |
| 13 | —12½ in. Collar | 1 |
| 14 | —Concrete Base of 1-3-6 mixture. Material required: | |

| | Cement. | Sand. | Stone. |
|---|---|---|---|
| 35 ft. pole | 8 sacks | 24 cu. ft. | 48 cu ft. |
| 40 ft. pole | 9 sacks | 26 cu. ft. | 51 cu. ft. |
| 45 ft. pole | 9 sacks | 27 cu. ft. | 54 cu. ft. |


TRUSSED POLE
FOR USE WHERE GUYS CANNOT BE PLACED
This rod has an eye at each end. Distance between centers of eyes 10'
This rod has an eye at one end and at other end is threaded back 6". Distance from center of eye to end of rod: for 35' Poles 6'0" 40' " 10'6" 45' " 13'0"
This rod has an eye at one end and at other end is threaded back 6". Distance from center of eye to end of rod 10'6"
6" for 35' Poles 6.5" for 40' Poles 7" for 45' Poles
Concrete Envelope 1-3-6 Mixture
D 51.1


TRUSSED POLE
FOR USE WHERE GUYS CANNOT BE PLACED
SHOWING METHOD OF ATTACHING STRAIN INSULATOR
Loop of ¾" wrought iron. Same as used in 11000 volt dead end except that this loop is of ¾" iron. (See Item 4, Sheet D61.1)
Washer
HUBBARD TRUSS ROD BRACE
D 51.2


TRUSSED POLE
FOR USE WHERE GUYS CANNOT BE PLACED
A B C D
Large Collar 12½" 5⅝" 10⅝" 17"
Small Collar 8½" 3⅛" 6⅝" 13"
COLLAR FOR ATTACHING ROD TO POLE
D 51.3

# JOURNAL OF ELECTRICITY
POWER AND GAS

FOUNDED 1887

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NOTICE TO ADVERTISERS.

Change of advertising copy should reach this office ten days in advance of date of issue. New advertisements will be accepted up to noon of Monday dated Saturday of the same week. Where proof is to be returned for approval, Eastern advertisers should mail copy at least thirty days in advance of date of issue.


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**Correction.**—A personal mention in this journal of September 5th gave the erroneous impression that the National Carbon Company of Cleveland, Ohio, was a works of the General Electric Company. The National Carbon Company advises that it is independent of all commercial and other alliances, and has requested that due notice be made of this fact.

## Loyalty

In these stirring war times the intense loyalty of the different peoples in serving their respective countries induces a responsive thrill in the breast of every true man. Ever has it been thus, war and loyalty, a spectacular service fanning into flame the smoldering coals of loyalty. Loyalty, literally faithfulness to the law, always appears when law and order are threatened.

Yet it is not right to view the warrior as the one type of loyalty. Every service, no matter how humble or obscure, requires loyalty for its fulfillment. Consider the patriot, the martyr, the mother. Loyalty is the actuating impulse of service.

Here then lies the lesson for every man who realizes that "he profits most who serves best." Only the loyal are on the royal road to service; their reward, their royalty if you will, is commensurate with their loyalty. Especially is this true for the employe of the business corporation which makes service to the buying public its prime object. Be loyal.

In being loyal you help yourself infinitely more than you help your employer. Josiah Royce has said: "In loyalty, when properly defined, is the fulfillment of the whole moral law." He defined loyalty as "the willing and practical and thorough going devotion of a person to a cause."

This one idea contains the essence of the teachings of the sages of all ages. The loyal man is true, he is just, honorable and charitable; he is unselfish, self-controlled and in love with his cause. Whether exemplified as the devotion of the mother, the self-sacrifice of the Samurai, or the fortitude of the martyr, loyalty is the acme of virtue. Nor is this a mere moving-picture of platitudinous praise, but rather a suggestion to be actively applied in every man's life, in the home, in the business and in the nation.

The salesman can be loyal to his cause, the house for which he is working. He can express his individuality in striving for its profit. He has chosen his cause. Let him believe in it, let him freely devote his energy and enthusiasm to its accomplishment. The same phase of loyalty which is active as fair play in sport, or a chivalrous respect for the adversary in war, should characterize his treatment of competitors. His ultimate success will probably be in direct proportion to his loyalty.

The public utility official has a chosen cause, the service of the public. Let him perform that service willingly, graciously, courteously. He will find that loyalty is contagious, that his loyalty to his cause will attract the loyalty of others to him and his cause. If his cause be subject to untoward attack it is the more susceptible to loyalty, which always is strengthened by the buffeting of misfortune.

The banker has now great need for loyalty to his country. Indeed the accusation is made that the present money stringency is largely due to the disloyalty of the bankers in refusing assistance to worthy

plans for development. The needs of America should take precedence over European loans. The benefits of loyalty are in a large measure dependent upon the cause. If the cause be a predatory one, such as a pirate band which lives by overthrowing the loyalties of others, it involves disloyalty to the spirit of loyalty itself, and its benefits are for the few rather than the many. Thus while loyalty is good for the individual man, it may be disastrous for those whom his cause assails.

Loyalty binds many individuals into one service, one unified cause, which lifts them above their petty differences. It makes men consult socially so as to define the purpose of their lives. It brings wide toleranec of the sincere beliefs of other men, inculcates decision and makes for faithfulness. Its principles are instilled by the idealization of the cause and by the knowledge that loyalty to loyalty invariably pays.

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**Efficiency Standards**

The efficiency of a small business is usually determined by comparing out-go with income. The business is a paying venture if this ratio be an improper fraction and is a losing one if it be proper. With a large business where this method is impracticable or where the efficiency is near unity it is better to find the losses and add them to the out-go to determine the income. The manifold advantages of the latter method has caused the adoption of a system of corporation book-keeping which will show where the loss as well as the gain takes place. It is essential that a manager know this and his success is often determined by his ability to minimize the loss.

There is probably no industry in which the efficiency of apparatus is more closely determined than in the electrical business where standards have been adopted and the results of physical investigation applied. It may be due to this fact that the electrical business is leading all others in the attainment of uniformity in accounting. Such is true not only in central station, railway, and telephone practice, but also in the manufacturing and selling end.

The first requirement in this arithmetical problem in ratio is to reduce to some common denominator the many factors that enter into it. This denominator depends largely upon the character of the business and the purpose to which the figures are to be applied; in traction work it may be the ton-mile, in central station the watt-hour, and in telephone practice the wire-mile or the station, and in general is some factor involving time, space, weight or wage. These factors are as varied as the forms of business enterprise that they comprise and include much data which may appear extraneous. Adopting the electrical analogy, the efficiency of a business as a whole varies with good or bad times much as that of an electrical system depends upon its load-factor. Internal friction, such as conflicts between employer and employee, have a great bearing on business success. Competition has many points in common with resistance, and freight charges and drayage with transmission and distribution.

Such comparison might be continued indefinitely but it is of merely passing interest. Whereas the greatest efficiency losses usually occur in the motors of an electrical system, so in a business it is upon the efficiency of his subordinates that the manager of a great corporation must rely. No standardization of routine yet devised will eliminate the personal equation. Yet great success is being obtained by setting a standard which gauges a man's efficiency by his record of performance. To the man this acts as an incentive for improvement and to the manager it indicates the unfit, who must obey the usual law of survival.

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**The Point of View**

It is difficult to find an article in the technical press which does not contain some comparison of different ways of doing the same thing. Such comparison may be either direct or implied. It is sometimes obvious and sometimes veiled. The advantages of one method are listed against those of another and evidence is presented as to why the one should be adopted. The intent is to show that certain apparatus is better than any other. These articles are usually written by unbiased engineers incorporating the results of their personal experience. But "what is one man's meat is another's poison," and what is one man's success may prove to be another's failure. No method should be adopted or discarded on the dictum of one observer, for we are all liable to err. It is only from a consensus of competent opinion that fair judgment can be given. A method which is acceptable to a theorist may be of little value in practice, whereas the practical "rule of thumb" may prove cumbersome and unsatisfactory for scientific work.

A good machine in poor hands or under adverse conditions may make a poor showing as compared with a less efficient one properly run. This has been demonstrated many times in tests of steam turbines and reciprocating engines. Requirements may differ so that what is good under one set of conditions is of no value under another. An impulse water-wheel would offer little competition to a gas engine in the Sahara desert, and one match would be worth more than a carload of electric cigar-lighters at the South Pole.

Furthermore, it is possible for a method to be at once the best and the worst. An example of such duality was afforded recently in an advertising competition in which the same copy was entered by two people, one of whom considered it the best and the other classifying it as the worst. Both opinions were accompanied by good evidence to support their contentions and both were right—from their own viewpoint. The most brilliant diamond is lusterless in some lights and from certain angles the imitation may rival the genuine.

These examples all show how unstable is the sensitive balance which determines the superior and the inferior. It sways with the slightest change in external conditions, its counterpoise is unprotected and parallax causes many a mistake. Even the equilibrium established by time is liable to change at any moment when some new method, perhaps once condemned, takes the place of the old, tried and true though it be.

# PERSONALS

**E. C. Eaton,** hydroelectric engineer from Idaho, is at San Francisco.

**K. G. Dunn,** vice-president Hunt, Mirk & Co., Inc., of San Francisco, is at Seattle.

**Geo. J. Henry,** hydraulic and mechanical engineer, has returned to his offices in San Francisco.

**F. W. Milenz,** manager Napa Valley Electric Company, has returned to St. Helena from Los Angeles.

**Geo. D. Smith,** supervisor of agencies of the General Vehicle Company, New York, is at San Francisco.

**Frank J. Somers,** proprietor Century Electric Company, San Jose, is spending a few days in San Francisco.

**W. F. Williamson,** vice-president of Van Emon Elevator Company, leaves this week on a trip to New York.

**C. V. Schneider,** manager Electrical Supply Company, Sacramento, spent a few days in San Francisco last week.

**C. C. Hillis,** vice-president of Electric Appliance Company, has returned to San Francisco from a visit to Chicago.

**Jos. C. Hobrecht,** electrical contractor at Sacramento, made a short trip to San Francisco, the latter part of last week.

**J. T. Euclist** of the Kern Valley Electric Company, Bakersfield, California, was a visitor in San Francisco during the week.

**Geo. Bundy** of the firm of Pease, Bunday & Taylor, Porterville, California, spent a few days in San Francisco during the week.

**O. A. Schlesinger,** Pacific Coast manager U. S. Light & Heat Company, storage battery manufacturers, is at Los Angeles.

**T. E. Bibbins,** local manager General Electric Company at San Francisco, has returned from a trip through Southern California.

**W. L. Frost,** distributing agent Southern California Edison Company at Redlands, California, spent his vacation in San Francisco recently, being duly and properly amazed at all he saw.

**S. K. Colby,** formerly vice-president Pierson-Roeding Company, who has been visiting in California for several weeks, has returned to the East.

**James I. Colwell,** manager Seattle-Portland branch Western Electric Company, spent the week end at the Jobbers' convention at Del Monte.

**H. W. Phillips** of Washington, D. C., has been visiting the Coast in the interests of the associated independent electric elevator manufacturers.

**L. H. Mace,** city representative Electric Railway and Manufacturing Supply Company, has recently severed his connections with that company.

**Paul A. Shilton,** Los Angeles, representative of R. J. Davis, sales agent for Century motors, has been visiting the cities of Southern California.

**A. G. Jones** of the engineering department General Electric Company, San Francisco, recently returned from a several weeks' trip through Nevada.

**R. J. Davis,** western representative Century Electric Company, St. Louis, leaves for the East October 2d, where he expects to be for about thirty days.

**H. C. Goldrick,** Pacific Coast sales manager Kellogg Switchboard & Supply Company, returned from a business trip throughout Southern California.

**H. H. Cudmore,** director Mazda bureau of General Electric Company of San Francisco, was the guest of Hal Lauritzen and party on an automobile trip throughout the San Francisco bay region last Sunday.

**C. W. Harris,** professor of civil engineering at the University of Washington, Seattle, while on a year's leave of absence, is devoting his attention to the development of small water powers in the Cascade Mountains.

**F. W. Gillan,** in charge of the pole department of Pierson, Roeding & Co., has returned to San Francisco after an extended visit to the Northwest, where he visited the mills, yards and forests of the company he represents.

**Geo. A. Wooley,** manager of the supply department of the General Electric Company at Denver, is at Salt Lake City on his regular trip of inspection of the local offices there whose business is handled through the Denver office.

**E. J. Kulas,** president of the Tungstolier Company, has succeeded **V. R. Lansingh,** as manager of the Glass and Metal Reflector Divisions of the National Lamp Works of General Electric Company, Mr. Lansingh having resigned to become connected with the Hardware Buyers' Association of Chicago.

**H. F. Yost,** formerly with the Electric Stores of Sacramento, has joined the forces of the Electric Railway and Manufacturing Supply Company of San Francisco; **H. H. Hoxie,** formerly with the Crocker-Wheeler Company of Los Angeles, will join the same company about the first of the month, and will represent the manufacturing department in San Francisco; **B. Y. Gibson** has recently severed his connections with the company

## OBITUARY.

C. N. Felton, president of the Snow Mountain Power Company and formerly United States Senator from California, died at his home in Menlo Park, California, on September 13, 1914, after an illness of two weeks. Senator Felton came to California in 1849, being 82 years of age at the time of his death.

Chas. W. Quilty, for many years president of the San Jose Light & Power Company, and second president of the Pacific Coast Gas Association, died at San Jose, California, September 22, as the result of a general breakdown. He was a prominent figure in the early California light and power developments and a son-in-law of the late James A. Hagan.

## MEETING NOTICES.

### Sacramento Jovian League.

On Wednesday, September 16th, the Sacramento Jovians held their usual weekly luncheon at the Peerless Cafe. Mr. H. H. Cudmore, Chief Stentor of the Jovian Order, gave an interesting and instructive talk on Jovianism in Commercial Co-operation. His remarks were much enjoyed by the large number in attendance, several San Francisco Jovians being among the number.

### Electrical Development and Jovian League.

The regular weekly luncheon of the Electrical Development & Jovian League of San Francisco was addressed on September 22 by P. F. Valentine, professor of history at the San Francisco State Normal School. He reviewed in masterly manner the possible effect of the European war on American business. The league took action condemning the practice of the municipal plant at Alameda in selling lamps and appliances below established prices and indorsed the electrical page now appearing every other week in the San Francisco Call.

### San Francisco Section A. I. E. E.

The first meeting of the 1914-15 season of the San Francisco Section American Institute of Electrical Engineers was held at the Engineers' Club, Friday evening, September 25th. L. F. Fuller presented an interesting paper on "Daylight Absorption in Long Distance Radio-Telegraphy."

**San Francisco Section Electric Vehicle Association of America.**

The first open meeting of the San Francisco section was held at the rooms of the Engineers' Club, Thursday evening, September 17th and judging from the large attendance and interest displayed, the success of the local branch is assured.

The speaker of the evening was C. H. Hutton, local representative of the General Vehicle Company, who presented a paper on "Merchandise Delivery Costs," graphically illustrated by comparative cost charts. Discussion of the subject was indulged in by those present and Mr. George Drake Smith, the guest of the evening, was introduced. Mr. Smith has recently been appointed agency manager of the General Vehicle Company. During his trip from New York to the various Pacific Coast agencies, the vehicle men of San Francisco prevailed upon him to meet with them at their opening meeting and tell them of the work of the National Vehicle Association, of which Mr. Smith's brother is president. The speaker dwelt at length on the organization's work and gave his hearers much interesting and instructive data in the marketing of electric vehicles.

**Jovian Electrical League of Southern California.**

With characteristic enthusiasm and a feeling of comradeship which breathed the very spirit of commercial cooperation, the Southern California Jovians assembled in Los Angeles for the season's first luncheon at Christopher's on Wednesday, September 16th. About 125 Jovians were seated at the tables when Chairman Colkitt extended his greetings and requested everyone present to announce his name and firm affiliation, so as to insure a thorough acquaintanceship. Most of those present wore their white ribbons emblematic of Jovian day. A splendid musical program was arranged by Stentor Morphy, through the courtesy of Manager Quinn and the singing and playing of Miss Sutter and Mr. Alser were thoroughly appreciated. The chairman of the day, F. F. Foster, then introduced Superior Court Judge Craig, who spoke on "Criminology." He explained the aims and purposes of the California Institute of Criminology, namely to effect reforms and prevent crime. He pointed out the necessity of treating criminals as individuals and not as a class. He favored the giving of employment to criminals and that the proper care and study of the criminals was a matter of economy to the state. He not alone works for his own support but also those dependent on him. He spoke highly of the San Diego Municipal Farm where each criminal receives fifty cents per day and his board.

Another interesting talk on the "The Prevention of Industrial Accidents was given by R. L. Eldringham, safety engineer of the California State Accident Commission. He advocated the establishment of a national Bureau of Industrial Safety. He stated that 35,000 persons are killed in the United States through accidents each year, or one every fifteen minutes, most of which are preventable. He referred particularly to the necessity and ease of guarding against electrical accidents. Forty per cent, he argued, could be prevented by mechanical safeguards and 60 per cent of the total 90 per cent of preventable accidents, by education. He warned his hearers against forming the "I should worry" habit.

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**NEWS OF IDAHO PUBLIC UTILITIES COMMISSION.**

The commission has granted to Dumble Bros. a certificate for the construction and operation of a system for the generation, transmission and distribution of electrical energy in the village of Plummer, Idaho.

At the request of the Washington Water Power Company its application for a franchise at Kendrick, Idaho, has been dismissed.

The complaint that the Idaho-Oregon Light & Power Company had not furnished service to Donald H. Davis was dismissed upon evidence that current was now being furnished the complainant.

With regards to the complaint of several milling companies in the upper Snake River Valley that the rates of the Utah Power & Light Company were unreasonable, the commission ordered that the hearing be continued until December 1, 1914, until a proper schedule can be determined. Meanwhile the company is authorized to collect the former rates with proviso that any excess or deficiency be refunded or collected when final decision is made.

An order has been issued granting the Wood Livestock Company, Ltd., permission to construct an electric light and power system at Spencer, Idaho. There was no public hearing on the matter as the territory which the company intends to serve is not now supplied with electric power and the new company will not be encroaching on territory already entered by any rival concern.

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**NEWS OF CALIFORNIA RAILROAD COMMISSION.**

The Union Home Telephone & Telegraph Corporation, operating in the counties of Orange, Los Angeles and San Bernardino, has filed an application requesting authority to renew for a period of one year promissory notes totaling $24,700.

The commission has authorized the San Joaquin Light & Power Corporation to renew promissory notes totaling $64,-156.48 for a period not to exceed one year.

The commission has issued a supplement to its order permitting the Fowler Gas Company to issue $15,000 of 10 year 6 per cent bonds, in which it provides that the bonds shall be issued so as to net the applicant not less than 85 per cent of their par value.

The commission has issued a supplemental order authorizing the Southern California Edison Company to sell $187,-000 face value of its bonds to the Harris Trust & Savings Bank of Chicago. The bonds are to be sold at not less than 87½ and the proceeds will be used to discharge a note of $150,000 held by the savings bank. Any remainder will be turned into the company's treasury to be used in such manner as may be permitted by the commission.

The Pacific Light & Power Corporation has filed an application with the commission asking authority to issue to trustee 170 of its first and refunding mortgage bonds at a price acceptable to the commission.

The commission has rendered a decision authorizing the Snow Mountain Water & Power Company to transfer and lease certain of its properties in Mendocino County to the California Telephone & Light Company in return for a promissory note amounting to $790.18.

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**NEWS OF WASHINGTON PUBLIC SERVICE COMMISSION.**

The following causes have been set for hearing:

1607. September 30, 9:30 a. m., R. A. Morris vs. Puget Sound Traction, Light & Power Company, street car route.

1748. October 1, 9:30 a. m., Seattle, City of Seattle vs. Seattle, Renton & Southern Railway and Scott Calhoun and Joseph Parkin, receivers. Increase rates.

1539. October 6, 9:30 a. m., Seattle, F. W. Browne vs. Pacific Northwest Traction Company. Rates.

1648. October 6, 9:30 a. m., Commission ex rel. O. J. Travis et al. vs. Pacific Northwest Traction Company., Everett Light & Water Company and Puget Sound Traction, Light & Power Company. Commutation tickets.

1723 October 8, 9:30 a. m., Seattle, Commission ex rel. City of Seattle vs. Puget Sound Traction, Light & Power Company, Seattle, Renton & Southern Railway, and Scott Calhoun and Joseph Parkin, receivers. Transfers.

1741. October 9, 9:30 a. m., Seattle, Commission ex rel. B. Weiman vs. Richmond Beach Telephone & Power Company. Service.

1760. October 14, 9:30 a. m., Port Townsend, Commission rel. City of Port Townsend vs. Key City Light & Power Company. Rates, etc.

1700. October 20., 9:30 a. m., Everett, Commission ex rel. Geo. T. Hendrie et al. vs. Everett Gas Company. Rates.

## PACIFIC COAST GAS ASSOCIATION CONVENTION.

The twenty-second annual convention of the Pacific Coast Gas Association, which was held at Long Beach, Cal., September 15-19, was voted the most successful meeting ever held by the Association, not only due to the character of papers which were presented, but to the general interest manifested in the papers by the members in attendance. Mr. Champ S. Vance of Los Angeles presided.

The appliance exhibit was one of the best ever given under the auspices of the Association and was an extremely creditable exposition, to which the public were invited.

The ball on Wednesday evening, September 16, was a brilliant success, the banquet on Thursday evening was voted the best ever, and the outing to Catalina on Friday was an affair enjoyed by all.

The authors of the composite papers on the "General Utilization of Gas," Messrs C. B Babcock, R. J. Thompson, B. S. Pedersen, H. P. Pitts and H. S. Basford, were, upon motion made before the convention, awarded each a gold medal for their efforts. The paper by D. E. Kepplemann on "Welding in Gas Distribution" was heard with considerable interest.

One of the important matters taken up was the International Gas Congress, which is to convene in San Francisco in September, 1915, and Mr. John A. Britton, chairman of the local committee, gave assurances that the Association would be prepared to act as host and maintain the usual standard of California hospitality.

The following were elected to serve as officers and directors for the ensuing year: President, E. C. Jones, San Francisco; vice-president, Frank A. Cressey, Jr., Modesto; secretary-treasurer, Henry Bostwick, San Francisco; directors—Messrs. John A. Britton, San Francisco; C. O. G. Miller, San Francisco; W. B. Cline, Los Angeles; W. G. Kerckhoff, Los Angeles; V. W. Papst, Portland, Ore.; C. B. Babcock, San Francisco; Robt. J. Thompson, San Francisco.

Mr. Harry L. Strange of Honolulu was in attendance, which added considerable zest to the meeting, and at the banquet expressed a desire that the Association might arrange to hold a meeting in Honolulu at some future time, and at the same time extended a cordial invitation to the Association so to do, assuring the members that the citizens of Honolulu would leave no stone unturned toward making their visit a pleasant one.

## TRADE NOTES.

Walter L. Rodgers, San Francisco, has installed a 200 h.p. Diesel internal combustion engine at Solomon, Alaska, to operate a gold dredge.

The A. G. Electric Manufacturing Company of Seattle has recently installed switchboards for the Pantages and Liberty theatres at Seattle and the Orpheum at Portland.

The Board of Public Works of Los Angeles has requested bids for the installation of ornamental lighting fixtures on Wilshire boulevard as well as concrete posts. Specifications may be had from the city electrician.

The first electrically operated redwood lumber mill is that of the E. B. Salsig Lumber Company, at Gualala, Mendocino County, California, the electrical installation being made by the Allis-Chalmers Company.

The city council of Seattle has passed an ordinance transferring to the department of buildings the powers and duties of the city electrician relating to the installation, alteration and extension of electrical wiring and equipment.

The Bowie Switch Company of San Francisco has been advised that the U. S. Patent Office has granted its claims for an air-break switch, including claims for magnetic horn blowout and follower contacts. These claims have been pending for eight years.

Blaine Grey and Alvin Sessions, formerly employed by Eardley Bros. at Salt Lake City, have recently resigned their positions with that firm to open up a business in the Keith Emporium to be known as the Keith Emporium Electric Company.

The Doerr-Mitchell Electric Company, Spokane, Washington, has the contract for 600 light brackets for the new Davenport hotel, these to be used in bureaus and dressers. The fixtures were designed by the company and are being manufactured in its local factory.

Eardley Bros. of Salt Lake City have recently obtained a contract for equipping the new Windsor Hotel which is being remodeled and refitted by A. Fred Wey, formerly manager of the Wilson Hotel. Special Brascolite fixtures will be used throughout the lobby, corridors, and public places of the hotel. The contract includes the installation of an animated electric sign.

The Independent Electric Company of Salt Lake City has been awarded contracts for electrical wiring in the high school building at Kamas, Utah, by contractors Mortenson & King; wiring of the new buildings to be erected at State and Exchange streets, by J. H. and H. E. Schraven; wiring of the garage building for the Continental Oil Company by contractors J. H. and H. E. Schraven.

The members of the Salt Lake City Lodge No. 357 of the International Brotherhood of Electrical Workers have voted to declare a strike in this city, but at the time of this writing the men have not quit work. The difficulty between the contractors and the electrical workers arises from the flat refusal of the ten electrical concerns of the city to recognize Mr. E. A. Wilcox as business agent of the union. The contractors say that while they have no difficulties or differences with their men they cannot stand for his methods. The electrical workers insist that this be done and unless some common ground can be located a strike will result.

W. H. Rogers, an expert in the power and mining department of the General Electric Company at Schenectady has been detailed by his company to make an investigation of the problem of electrifying the steam shovels of the Utah Copper Company, at Bingham, Utah. The steam shovel operations of this company are the largest in the world. An entire mountain of low grade copper ore is being eaten away by 30 to 40 monster steam shovels which are constantly in operation. The problem presented in the electrification of these steam shovels is an extremely difficult one, but President D. C. Jackling of the Utah Copper Company, who is also President of the Utah Power & Light Company, from whom the Utah Copper Company purchase their supply of power, is extremely anxious to see this electrification effected.

## INCREASED P. P. I. E. FOREIGN PARTICIPATION.

Early in August, in response to inquiries from all parts of the globe, the management of the Panama-Pacific International Exposition announced that the exposition would not be postponed. The development of events since that time, in their relation to the exposition, all tends to confirm the wisdom of that original decision. When the decision was made no word had been received from any European nation as to what effect the European war would have upon its plans. In the last six weeks, however, it has become evident that many European nations will be represented at San Francisco.

So rapid has been the progress in the construction of the city of foreign government pavilions and palaces to the west and south of the Palace of Fine Arts during the first six weeks of the European war that each of them appears to be making an extra effort to surpass its neighbors. Of the

40 foreign governments which have committed themselves to participate, not one has withdrawn. On the contrary, many have applied for more exhibit space, and some have greatly increased their appropriations. Spain, France, Italy, Holland, Japan, China, Sweden and other nations in the war zone have officially notified the exposition that they will proceed with their buildings or exhibit despite the war.

The beautiful pavilions of Sweden, Bolivia, the Philippine Islands and Cuba are from 80 to 90 per cent completed. Those of Honduras and Canada—the latter a huge structure to be filled wholly with displays from Canada and moving picture halls—are finished. The German Kali Syndicate building, constructed in part by the German government, is more than half finished, as is the Holland pavilion, which is set in a large garden. The huge Chinese building, as well as the two mosque-like buildings of the Ottoman Empire, are nearly half completed. The three government buildings of Japan, to be set in a four-acre garden, are being built in Japan, to be sent "knocked down" and erected between the palaces of Cuba, Denmark and France, one of them being an ancient temple. Australia and New Zealand are rushing their buildings, which are over 25 per cent completed. The Chilian and Peruvian buildings will flank that of New Zealand, while Italy, Brazil and Argentina surround Turkey on three sides.

Within ten days after the war broke out Holland had increased its appropriation from $100,000 to $400,000 and ordered that construction be rushed upon the great Netherlands pavilion, immediately adjoining the Palace of Fine Arts.

The Persian display has been assembled at Teheran, and is ready for shipment. Spain, which had not decided to participate officially before the war, has since voted an initial fund of $100,000 for participation.

England, Germany and Austria will be represented by individual exhibitors or by associations of exhibitors. Norway is proceeding actively with her plans, and Denmark broke ground for her pavilion the first week in September. The Argentine Republic, in view of the new trade alignments between the American continents, has increased its appropriation from $1,250,000 to $1,750,000; Italy has ordered construction rushed upon her great pavilion. Since the war broke out important publications in France have written the exposition for illustrations and data.

The Grand Duchy of Luxemburg, despite the war, has prepared and shipped a marvelous exhibit of unnamed roses to compete for the $1000 prize for the Panama-Pacific International Exposition Rose. The Netherlands for its great government horticultural exhibit has asked for and has been granted 52,000 square feet of space, and the plants are being assembled in seven different cities in Holland, under the supervision of government experts. Japan has asked for 8000 additional square feet of exhibit space for her horticultural exhibit, making altogether in the competitive horticultural exhibit a total of 12,000 square feet. This is in addition to a four-acre garden. Japan will be represented upon a vast scale in all the exhibit palaces. Cuba has asked for additional space, and is making elaborate arrangements for her $250,000 display.

France has cabled that her plans are unchanged. Aside from the action of the French Exposition Commission the athletic department of the Exposition has received word from France that there will be a representation in the athletic events.

Undoubtedly some of the entries on the athletic sports program will not be made and some of the art treasures intended for the Palace of Fine Arts will not be shown at San Francisco because of the war, but not by any means the majority, or the most important of them, and there are many factors in the situation which will more than compensate for these losses.

Since the war broke out there has been a very sharp increase in the demand for exhibit space from the manufacturers of the United States, South America and the European nations not at war.

While there is now no doubt that many European nations will be represented at the exposition, it is apparent that in addition there will be an unprecedented representation from South America and the Orient, as well as from Central America.

The exposition has become very important in an extraordinary economic situation. Manufacturers and exhibitors from South America and the Orient are preparing for a liberal representation. Cochin China, Indo China and Siam, the Philippines and many of the states of India and South Africa are beginning their preparations.

In regard to attendance, traffic managers are of the opinion that the European war is likely to increase travel to California in 1915 rather than to reduce it.

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## SOME ETHICS OF THE TELEPHONE.

A citizen called upon an attache of the Borough President's office a few days ago on a matter that was of great interest to him, says the New York Times. He found the official polite and eager to be of service, but the caller had no opportunity to discuss the matter in any detail and finally he left feeling that his call had been wasted. Complaining of the matter later the citizen said:

"The telephone bell at the official's right hand kept up an almost constant ringing. One man at the other end of the wire had scarcely ceased talking when some other man called up and so it went on until I came away. I went to my office and rang the official on the telephone and under the pretense that I had forgotten to mention a fact to him, had a very satisfactory talk. That taught me a lesson. In the future I will pay no man the courtesy of a call until after I have jarred his ear with the telephone."

A few days later, the subject, dubbed as the "Insolence of the Telephone," was discussed at a luncheon between several well known politicians and business men. Said one of the business men:

"I consider it just as rude to be interrupted by the telephone when I am engaged with a visitor as to be interrupted by a clerk. I never permit it. The young woman who presides over the switchboard in my office never calls me or any other member of the firm when we are talking to a visitor. She is kept informed as to the time we are engaged, and she always tells the telephone caller that another caller who has paid the firm the honor of a personal call is present and he will have to wait."

The writer, continues the account, was talking with one of the biggest lawyers in this city, and had been with him for nearly an hour discussing a matter of interest, when a young woman glided into the room and whispered to the lawyer. He turned to the caller and said:

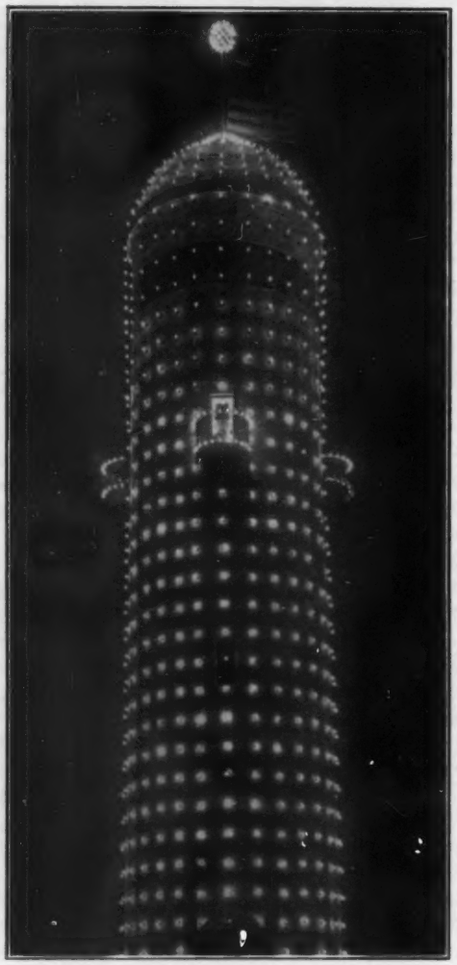
"Please excuse me. My wife is on the telephone. She is the only one I permit to interrupt me when I am engaged."

Congratulated on his method of curbing the telephone, he said:

"The telephone has no respect for any person and no matter what a man may be doing its ringing breaks in upon him and jars his brain. I would not permit it to intrude upon me for any consideration. It must take its turn and if the man at the other end of the wire isn't satisfied with that situation, he can take his business somewhere else. The man who calls upon me is the man who comes first. I have known men who have called here and finding me busy have gone to a telephone near by and tried to get my ear that way. It used to succeed at one time, but that time has passed."

# INDUSTRIAL

## LIGHTING AT THE CALIFORNIA STATE FAIR.



The Tower of Light.

The Tower of Light, one of the many striking illuminated exhibits at the California State Fair. In this exhibit 1460 Mazda lamps were used.

## EL RADIO, NEW LUMINOUS AIR HEATER.

A new luminous heater, known as El Radio, and of the glowing-coil-and-reflector type, is being manufactured by the Hotpoint Electric Heating Company of Ontario, California. This is not intended to take the place of a coal or wood stove or furnace, but serves for warming bathrooms, small offices and other small rooms, or in taking the chill off larger rooms.

The heater consumes 600 watts and can be attached to any lamp socket. It is equipped with cord, attachment plug and interchangeable switch plug, which can be used on other Hotpoint appliances.

This crescent shaped electric heater is formed of pressed steel, outside finished in polished nickel, with back of body in dull black, and the inside polished copper, lacquered to prevent tarnishing.

Its size at the feet is 9¾x11½ and the height over-all is 12 inches. A weight of only four pounds, and a wood handle at the top, make this little electric grate conveniently portable.

## MAZDA EXHIBIT AT CALIFORNIA STATE FAIR.

One of the most striking exhibits maintained in the Manufacturers' section of the California State Fair at Sacramento, and one that strikingly conveyed to the spectators the thought with which it was designed is that which announced the message "Mazda Means Something." The display consisted of a reproduction of a Mazda lamp in its correct proportions, 17 feet high, surmounted by an attractive electric sign which carried the slogan "Mazda Means Something." The lamp figure and sign were studded with about one thousand all-frosted 10-watt Mazda sign lamps. The presence of this display made it unnecessary for the management of the Fair to provide any additional illumination for the entire center section of the large Manufacturers' tent.

In addition to the large lamp figure a number of racks were erected from which were suspended a number of Mazda lamps ranging from the 10 watt to 1000 watt sizes. The display was enclosed by an attractive lattice railing and presented a very striking appearance.

The Mazda exhibit at the State Fair was supplemented by window displays and newspaper advertising maintained by the electrical dealers and central stations in Sacramento. The moving picture theatres were also used to call the attention of the public to the message that "Mazda Means Something."

The co-operative plan for telling this message to the public is under the direction of the Mazda Bureau of the General Electric Company, San Francisco, of which Mr. H. H. Cudmore, who is well known in electrical circles, is director. The field work is carried on by Messrs. F. J. Blaschke, Clark Baker and A. B. Bond.

## NEW CATALOGUES.

The Diesel Engine in the Brewery of the Anheuser-Busch Brewing Association, is the subject of an interesting pamphlet from the Busch-Sulzer Bros. Diesel Engine Company.

Western Electric Poles is the subject of an attractive pamphlet from the Western Electric Company which illustrates every detail of making a pole from the woods to the yard. Standard specifications for white and red cedar poles are included.

The Edison Lamp Works of General Electric Company has published several bulletins regarding the use of Edison Mazda lamps for different services. No. 43403 is concerned with store lighting, No. 43602 with series street lighting and No. 43404 with street car lighting. Each bulletin is essentially a text on its subject and contains many valuable and practical hints for the contractor and engineer as well as the central station solicitor.

The Bureau of Standards has just issued a new circular, No. 48, entitled Standard Methods of Gas Testing. The publication includes a detailed discussion of the various methods for determining the heating value, candle power, purity and pressure of gas and for testing gas meters which have been shown, either by careful investigation in the laboratories of the Bureau or by extended use elsewhere, to give results of sufficient accuracy to be regarded as standard.

"Silent Valve" Lighting and Charging Units—issued by The E. L. Russell Company, Indianapolis, Indiana, describes a generating set consisting of a high - speed rotary valve internal combustion engine direct connected to a generator. This company has issued a 28-page loose-leaf booklet disclosing in detail the construction of their new Rotary Valve for Internal Combustion Engines and various applications of same as related to Automobile, Marine, Stationary and other types.

# NEWS NOTES

## FINANCIAL.

PASADENA, CAL.—The city commissioners contemplate calling an election to vote bonds in the sum of $290,000 for the improvement of the municipal water system.

BRAWLEY, CAL.—Bids are being received by the City Trustees for the purchase of $35,000 in bonds voted for constructing municipal water works and a distributing system.

SEATTLE, WASH.—An ordinance has been passed ratifying and confirming a loan for the City of Seattle in the aggregate sum of $400,000 for the purpose of enlarging and extending the municipal light plant of the city. The bonds will run twenty years, and bear 4½ per cent interest.

GLENDORA, CAL.—Bonds in the sum of $37,500 have been voted for the purchase of the present domestic water distribution system of this city, and to make improvements necessary to a complete municipal water plant. Bonds in the sum of $25,000 were voted some six months ago, proceeds of which were applied to the purchase of water lands and the development of wells. A contract has been awarded the Layne-Bowler Company to test a well with view to installing a pumping plant.

SAN FRANCISCO.—The protective committee for the three-year 6 per cent collateral notes of the United Light and Power Company has been notified that the matured interest will not be paid within the 90 day default period. Under this condition, the note holders may take over the collateral consisting of the company's bonds. This company is a subsidiary of the United Properties Company. A letter from the protective committee ascribes the difficuties of the United Light and Power Company to the European situation.

## TRANSPORTATION.

SAN FRANCISCO, CAL.—The contract to lay the street car tracks and sewer lines through the Stockton-street tunnel, from Sutter to Sacramento streets, was signed by Eaton & Smith Company.

SAN FRANCISCO, CAL.—The Church-street railroad will be a combined electric and cable line line running over Church street without a curve. By a vote of 13 to 5 the Supervisors decided in favor of plan No. 7, offered by the Church-Street Railroad Non-Assessment League. Mayor Rolph says it will require ten days to study out some method of raising the money needed in addition to the bond money to finish the road. It will require about $150,000.

FRESNO, CAL.—The Fresno Interurban Railroad is planning an extension of a mile and a quarter to a point within 400 feet of the Normal School. J. B. Rogers, who is promoting the building of these lines, has made application to the Supervisors for a franchise extending from Fresno avenue to the Normal School. Rights of way are now being secured and a portion of the bonus desired has been subscribed. The new line will represent an increased capitalization of about $20,000.

FRESNO, CAL.—F. C. Webster, manager of the Fresno Traction Company, says that his company is ready to begin double-tracking Fresno avenue as soon as all franchise matters are cleared up according to city requirements. It is believed that the city will have all complications removed within three or four weeks. The construction work will last several weeks, as the old single track between Sylvia and Belmont avenues will have to be removed before the double tracks can be laid. The work will cost about $50,000.

SAN FRANCISCO, CAL.—Specifications for the Municipal Railway's California-street line have been prepared by the City Engineer and adopted by the Board of Works, but as this line would cost $127,500 and the available balance remaining in the bond fund is only $35,500, enough bonds to make up the difference will have to be sold before a contract for construction can be let. The sales of the $3,500,000 issue already made total $2,650,000, and the contracts so far awarded call for about $2,615,000.

SAN FRANCISCO, CAL.—Detailed surveys and drawings of the proposed municipal street car line through Golden Gate Park have been completed by City Engineer O'Shaughnessy. Owing to obstructions it will be impossible to run the road in a straight line and to make it conform to the general surroundings the plan is to start in at Tenth avenue on the northern side of the park and come out at Foureenth avenue on the southern side. Tenth avenue is the present terminus of a branch of the Geary-street road and this proposed extension it is believed will add a valuable feeder to the municipal line.

SAN FRANCISCO, CAL.—The Board of Works has filed a statement of the receipts and expenses of the Geary-street and Union-street municipal railway lines for the fiscal year that ended June 30. The gross receipts of the Geary-street line from July 1, 1913, to June 30, 1914, were $642,450, and the operating expenses $294,036. The obligatory charter charges and other reserves which had to be deducted were: Liability compensation from January 1, $3886; depreciation, etc., 18 per cent of the gross, $115,641; interest on bonds sold, 4½ per cent, $88,605. The true net profit was set down at $140,281 after making these deductions, aggregating $208,132.

OAKLAND, CAL.—At a special meeting of the directors of the Oakland Terminal Railways, W. A. Bissell resigned as president and director, and George K. Weeks succeeded him in the presidency. Mortimer Fleishhacker was elected to the vacant directorship. Mr. Weeks is head of the Pacific Coast department of N. W. Halsey & Co., whose clientele is interested in the $2,500,000 issue of Oakland Railways collateral trust notes. Mr. Fleishhacker is president of the Anglo-California Trust Company, which handled $1,100,000 Oakland Terminal collateral trust one-year notes. Mr. Weeks, in commenting upon his appointment, said that the change possesses no significance whatever from a financial standpoint, and that he is not taking the office as a representatice of N. W. Halsey & Co., or as a representative of any particular class of security holders, but in the hope that, under the special circumstances existing at the present time se can render service which will be of value to the property as such.

## ILLUMINATION.

LAS VEGAS, N. M.—Ornamental lamp posts are to be installed on grounds of New Mexico Normal University in immediate future.

MALTA, MONT.—A petition for a franchise for an electric light and power plant has been presented to the council by Shade & LeVesconte.

ASTORIA, ORE.—F. C. Harley of Astoria Harbor Improvement Company and others on Eleventh street, propose to establish "White Way" from the waterfront to Exchange street.

CENTRALIA, WASH.—The Crescent Oil Company has struck a flow of gas in drilling for oil near Tenino and will apply to the city commissioners for a franchise to furnish gas here.

PORTLAND, ORE.—Property owners on Fourth street from Jefferson to Burnside streets are contemplating installing a bracket lighting system.

YONCALLA, ORE.—An election will be held here in December to vote on the question of additional city indebtedness for the installation of an electric light system; estimated cost, $6000.

SEATTLE, WASH.—Bids will be received until September 30th by Port of Seattle Commission, Central building, for installation of a lighting system division of Smith's cove improvement.

LOS ANGELES, CAL.—The city electrician has been instructed to prepare a scheme of electric illumination for the city hall, as part of a general plan of the Business Stability Association that all buildings on Broadway be illuminated at night.

SANTA ANA, CAL.—Sealed bids will be received up to October 13th by the Board of Supervisors of Orange County, Cal., for a franchise to lay and maintain a gas distributing system along public highways near Bay City, in Orange County, Cal.

SPOKANE, WASH.—A private gas plant for Whitworth College has been taken under consideration by the building committee of the college and R. L. Edmiston and D. R. McClure have been appointed to investigate the cost of installing such a plant.

TUCSON, ARIZ.—The Common Council of the city of Tucson is receiving bids for supplying electrical equipment for the completion of the city's ornamental lighting system. Detailed specifications and drawings are on file with the City Recorder of Tucson.

ABERDEEN, WASH.—L. H Burnett and associates have made application to the Board of County Commissioners of Chehalis County for a franchise to lay and operate gas pipes and mains along the county highways. The application will be heard October 19.

MONTESANO, WASH.—L. H. Burnett and associates have applied to the board of county commissioners for a franchise to operate pipes and mains for the purpose of providing and conducting gas for public and private purposes on the public highways of the county. The Hearing is set for October 19th.

BAKER CITY, ORE.—The name of the Dry Gulch Ditch Company has been changed to the Dry Gulch Ditch and Electric Power Company. The company has a power site on upper Eagle creek, with a fall of about 200 ft., which will enable the company to use the water and then turn it back into irrigating ditches.

REDONDO, CAL—A petition signed by city property owners of Hermosa Beach has been forwarded to County Supervisors, requesting that they sanction the establishment of a highway lighting district beginning at Manhattan Beach city limits and extending to city limits of Hermosa Beach, a distance of nearly two miles.

BAKER CITY, ORE.—The Eastern Oregon Light & Power Company has let a contract to E. A. Jerome to replace the plant which was burned in South Baker. The buildings will consist of the main structure 40x82½ ft., a fuel bin 18x24 ft., 30 ft. high, and 400 ft. of conveyor trestle 24 ft. high. The whole contract amounts to $3000.

SAN MATEO, CAL.—By a vote of 33 to 11, the electors of the proposed Beresford highway lighting district decided in favor of incorporation. The election returns will be canvassed by the Supervisors, who will then proceed to declare the district incorporated. It is proposed to install ten lights along the main highway from the southerly limits of the Homestead to Beresford crossing.

NOGALES, ARIZ.—Spiro S. Proto, president of the International Gas Company, has received word that the Corporation Commission has granted the company the right to exercise the electric light franchise given them by the people of Nogales at a special election held last May. The gas company will now rush building plans as rapidly as possible, and is expected to have the plant in operation in about eight months.

MONROVIA, CAL.—The City Council has opened bids for the installation of a new street lighting system on Myrtle avenue. The lowest bidder was the Keystone Iron Works of Los Angeles, for $6688. Other bidders were: W. A. McNaly Company, Pasadena, $7059; Woodhill-Hulse Company, Los Angeles, $7000; M. J. McCune, Monrovia, $10,424; Frank C. Farr, Los Angeles, $9555; Newberry-Bendheim Electric Company, Los Angeles, $7473; D. S. McEwan, Ocean Park, $6800.

MARICOPA, CAL.—A big cut in the gas rate was offered to the consumers of Maricopa when the City Trustees met for the regular monthly business session, by the West Side Gas Company which serves the Midway with gas for fuel and lighting purposes. The letter from the president of the company to the Trustees stated that as the State Railroad Commission had cut the wholesale gas rate on which the company purchases the gas, the officials of the company were prepared to offer the Maricopa consumers a cut of 19 per cent over what has been charged up to the present time, if their offer should meet with the approval of the City Council and with the State Railroad Commission, which has the power to lower or raise any rate made by public service corporations.

## TRANSMISSION.

BOISE, IDAHO.—Fifty feet of the Idaho Power & Light Company's flume on the Malad River was partially wrecked September 11th by a storm and power from the company's plant near Mountain Home was cut off. An auxiliary steam plant in Boise, together with help from the Idaho Railway Light & Power Company, saved the day. Ordinarily the Idaho Power & Light Company supplies the Idaho-Oregon Light & Power Company with a large amount of power. This supply was shut off, as was the supply of the railway company, which purchases about 1000 h.p. The Idaho-Oregon Company is not affected to any marked extent as the purchased power is used for irrigation service, which has been temporarily discontinued. The railway company discontinuing its irrigation service, and otherwise lightening its load, was able to serve the Idaho Power & Light Company, considerable power in return. Forty men are at work under the direction of manager E. P. Bacon repairing the damage done to the flume and the work will be completed in a short time. The flume is one mile long and carries 1000 cu. ft. per second.

## TRANSPORTATION.

PORTLAND, ORE.—The council has granted a 25-year franchise to the Portland & Oregon City Electric Railway Company.

LYNDEN, WASH.—A franchise has been granted the Blaine-Lynden Interurban Company to operate over the city streets. Work to start before one year.

WENATCHEE, WASH.—Hyman Harris has been granted an extension of one year before beginning the construction of an electric railway in Chelan county between Malaga and Leavenworth.

VANCOUVER, B. C.—The B. C. Electric Railway Company will construct a line on South Cambie street from C to King Edward avenue, and thence to Main and Oak streets, the first of 1915.

TACOMA, WASH.—A contract for furnishing 118 tons of 70 lb. steel rails and 14 tons 91 lb. for the municipal car line has been awarded by Public Works Commissioner Woods to the U. S. Steel Products Company, the only bidder, for $41 per ton for 70 lb. and $52.45 for 91 lb.

SEATTLE, WASH.—A resolution has been introduced in the council offering to purchase the Seattle, Renton & Southern Railway and an ordinance, providing for the purchase of same. If voted by the council at the next meeting, the matter will be submitted to a vote on November 4th.